Products finishing

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FRED W. VOGEL, Managing Editor

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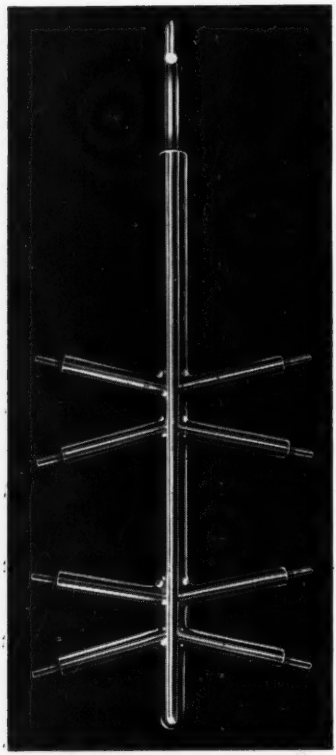

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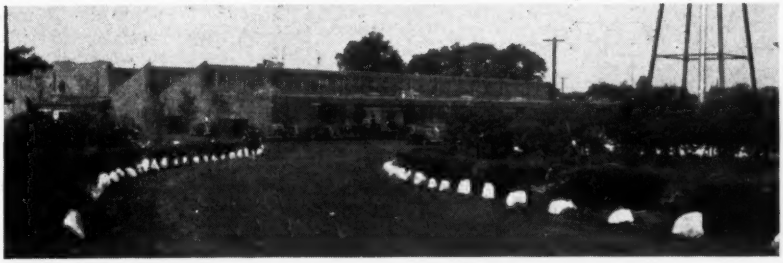

The Lionel Corporation Plant, Irvington, New Jersey.

Cleaning and Painting Parts by Production Methods at Lionel

By C. C. HERMANN

THE LIONEL CORPORATION, located at Irvington, N. J., and manufacturers of toy trains for the past 38 years, has the facilities for producing two-thirds of all the toy trains made in the United States. Some idea of the output may be obtained from the fact that over 200,000 locomotives, more than 1,000,000 railroad cars, and more than 3,000,000 feet of track, in addition to a very large production of toy stations, signals, and many other accessories required to produce a realistic toy train system comprise the bulk of the business.

Fifteen hundred employees find year-round employment in the plant and the writer's impression is that the majority of the employees of The Lionel Corporation are happily employed. The corporation has provided

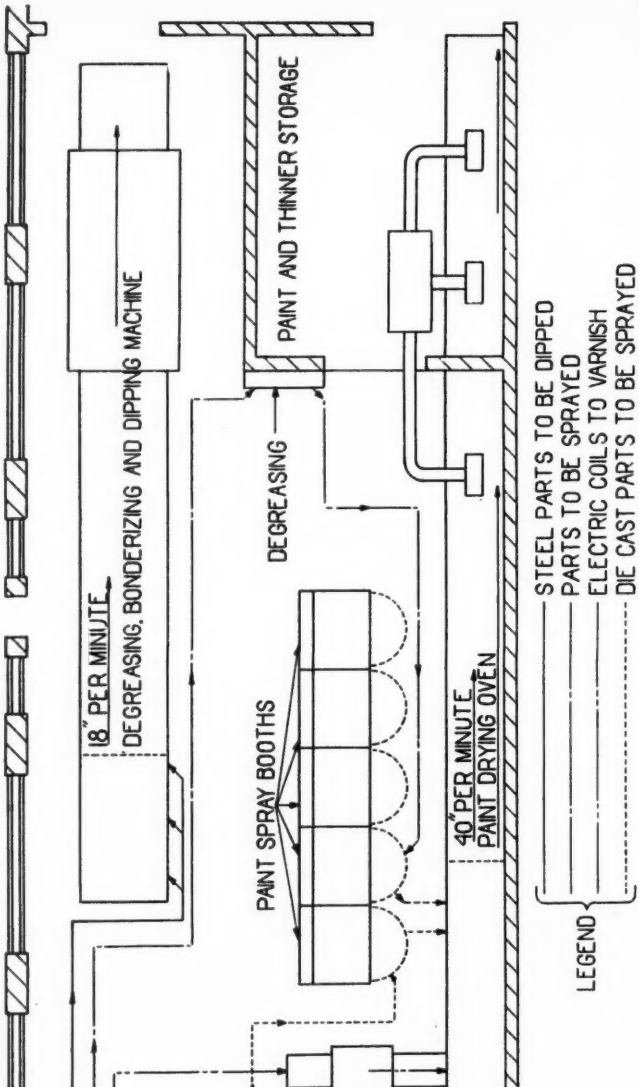

Fig. 1 — Diagram showing paint department layout and also the routing of various classes of work through the finishing operations.

an up-to-date and fully equipped club house with beautiful surroundings for the exclusive use of its employees.

In the headpiece is shown a view of the plant and also parking space provided for employees' cars, and the pleasing appearance of the plant in general. Buildings are single story sawtooth construction and provide excellent ventilation and natural light to the workrooms. The working departments are painted white throughout and kept in a clean, sanitary condition by a large maintenance force.

Even though paint departments are not always easy to keep clean, the standard of cleanliness set by The Lionel Corporation applies strictly to this

STAMPED STEEL PARTS

Schedule of Finishing Operations

1—Workpieces transported in truck to degreaser by stockroom boy
2—Await degreaser
3—Parts emptied into degreaser baskets
4—Degrease
5—Parts allowed to cool
6—Baskets unloaded into trucks
7—Baskets transported into trucks to girls
8—Parts removed from trucks and brushed by hand
9—Arranged on trays
10—Transported either to front or rear of spray booth
11—Placed on rotating arm by sprayer or operator behind booth
12—Parts sprayed on one side
13—Parts turned over
14—Parts sprayed on other side
15—Parts removed from rotating table
16—Parts transported to dryer
17—Drying operation in oven 22 minutes
18—Conveyed to assembling department

Fig. 2 — Operations chart showing schedule of operations for finishing stamped steel parts.

department. Diagram Fig. 1 shows the paint department layout with the routing of various classes of work through the finishing operation. It is interesting to note that although this paint department is only 40 ft. wide and 100 ft. long, all the millions of parts produced in this plant are cleaned and painted here. In this department, the closed solvent cycle of metal cleaning, and the spray painting and dipping operations are located.

Figure 2 shows a complete operation chart for stamped parts. The route of these parts is indicated by the dot and dash lines on the diagram illustrated in Fig. 1. It will be noted that the parts come into the department directly to the degreasing machine located at one end of the room.

The operation of degreasing workpieces is illustrated in Fig. 3. The parts are placed into a basket which is raised by means of a hoist operated on an overhead track. The loaded basket is then moved to a position over a tank of trichlorethylene, a stabilized chlorinated

Fig. 3—A vapor-phase degreaser into which the basket of parts shown in this illustration is immersed is used to remove oils and greases.

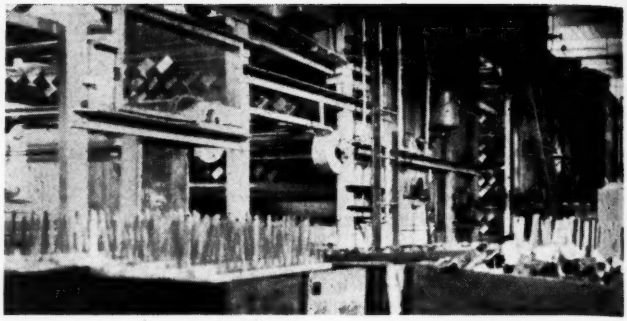

Fig. 4—End view of a combination degreaser, Bonderizing and dipping machine.

hydrocarbon solvent, which removes oil and grease. This solvent has a high specific gravity, is non-inflammable, and is a highly volatile fluid. After dipping in the tank of solvent, the basket of parts is rinsed in a pure solvent and then suspended in chemically pure solvent vapors, thus completing the degreasing operation. The cleaning tank is provided with weir walls so that the vapors which rise off the heated tank condense in the vapor tank and rinsing tank. The surplus condensation flows back over the weir walls into the initial tank and thus provides the closed cycle degreasing system.

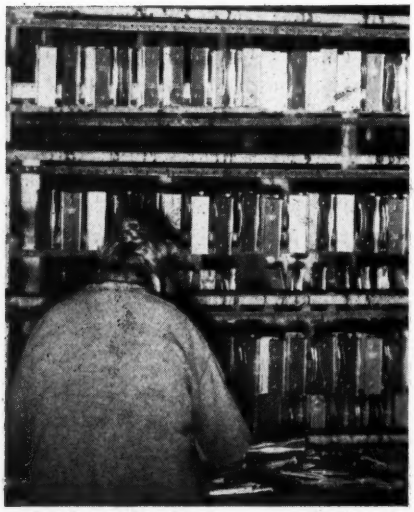

Fig. 5—The operator in this illustration is shown loading the combination degreaser, Bonderizing and dipping machine.

According to the present production schedule 24 lbs. of the degreasing compound are used for each 1,000 lbs. of product. The labor involved in the degreasing operation requires approximately one minute for 25 lbs. of the degreasing compound.

From the degreasing operation, the parts are moved to the spray booths which are shown diagrammatically in Fig. 1. Each spray booth is provided with a turntable, one-half of which is exposed to the back of the booth, where operators place the parts to be sprayed in position. A divided wall across the diameter of the table is provided with counter weights so that it may be raised or lowered at the will of the operator. While the spray operation is being performed on the parts on one-half of the table, the operator on the other side of the division wall removes the parts previously sprayed and arranges the table with a new batch of parts. The sprayed parts are then passed into a drying oven located along one side of the building. The oven is provided with a conveyor belt which travels at the rate of 40 in. per minute. A drying temperature of 180 deg. is maintained in the oven by means of thermostatically controlled electric heaters.

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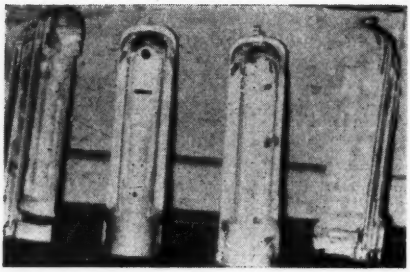

Fig. 6—A large portion of the die cast work consists of locomotive bodies such as are shown in this illustration.

ed by dipping, and for this operation, a combination degreaser, Bonderizing and dipping machine is used. This machine is located along the outside wall of the finishing department and is equipped with a conveyor which travels at the rate of 18 in. per minute. Illustration Fig. 4 shows an external view of this machine and in Fig. 5 is shown an operator hanging various steel parts on the conveyor hooks. The capacity of the machine varies according to the size of the parts handled. Illustration Fig. 5 shows the loading operation of bodies which are conveyed through the finishing sequence at the rate of 80 per minute. It is estimated that the cost of operation of this machine is approximately $2,000 per year. Seven pounds of degreasing compound are used for each 1,000 lbs. of work and the material cost has been figured to be approximately 87 cents per 1,000 lbs. of work.

Locomotive bodies are made of a die cast zinc alloy. Several of these castings are shown in Fig. 6. These castings require degreasing before assembly in the completed locomotive. Chart Fig. 7 shows the operations involved in handling these die cast locomotive bodies through the paint department. The route is indicated in Fig. 1 by the dotted lines. The operation of degreasing these parts is the same as that shown in illustration Fig. 3, and the method of spray painting is the same as described for the spray painting of the steel parts.

There is one other class of parts which pass through the painting department and this consists of the coils which are used in the electric

DIE CAST PARTS

Schedule of Finishing Operations

1—Transport workpieces by truck to scales
2—Workpieces counted at scales
3—Transported by truck to lithoform
4—Removed from truck and filings shaken out
5—Carefully placed in wire basket, piece by piece
6—Immersed in lithoform (two minutes)
7—Immersed in cold water (five seconds)
8—Immersed in hot water (30 seconds)
9—Baskets of workpieces allowed to drain off and dry
10—Basket picked up and returned to truck
11—Workpieces transported to girls
12—Pieces removed individually from truck
13—Dirt brushed off and pieces placed aside
14—Workpieces picked up and arranged on screen
15—Loaded screen transferred to place near front of spray booth
16—Screens stacked until operator is ready
17—Loaded screen transferred to spray booth

(12, 13, 14, 15, 16: These operations are repeated for all workpieces to be sprayed)

Fig. 7 — Operations chart showing schedule of operations for finishing die cast parts.

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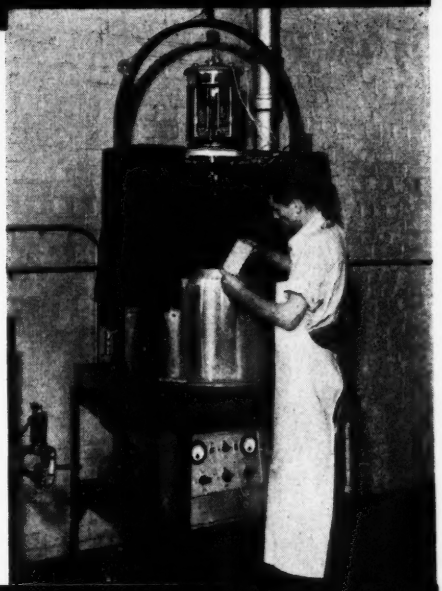

In the Weather-Ometer (at the right) Advance Finishes are given light tests, while in the Humidity Cabinet (above) they are given moisture tests . . . subjected to tests equivalent to years of sun and rain in actual service. Assure yourself consistently uniform and lasting finishes. Buy Advance!!

Fig. 8—The electric coil wire used in the electric locomotives is varnish coated before being wound on spools by the operator shown in this illustration.

locomotives. These coils, several of which are shown in the winding operation in Fig. 8, receive a varnish coating before they are transferred to the assembly department. The coils are dipped and allowed to drain and dry on special racks which pass through a drying oven which is located along one side of the room.

A view of the department where all of the component parts of the various devices are assembled and packed for shipment is shown in Figure 9.

It is apparent from the above that cleaning of the parts is emphasized in this plant. A good finish can only be obtained when the undersurfaces are thoroughly cleaned and dried.

Automatic Composition Applicator. A circular describing the new Hammond "Auto-Doper," which applies composition automatically to buffing wheels, is now being issued by Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich. This circular will be of particular interest to executives in plants using polishing lathes, semi-automatic and full automatic equipment. Copy free upon request.

Fig. 9—A view of the assembly and shipping department.

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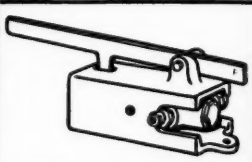

Sketch of Binks new 3-way valve for cam hand or foot control

Binks new adjustable bracket No. 256-A

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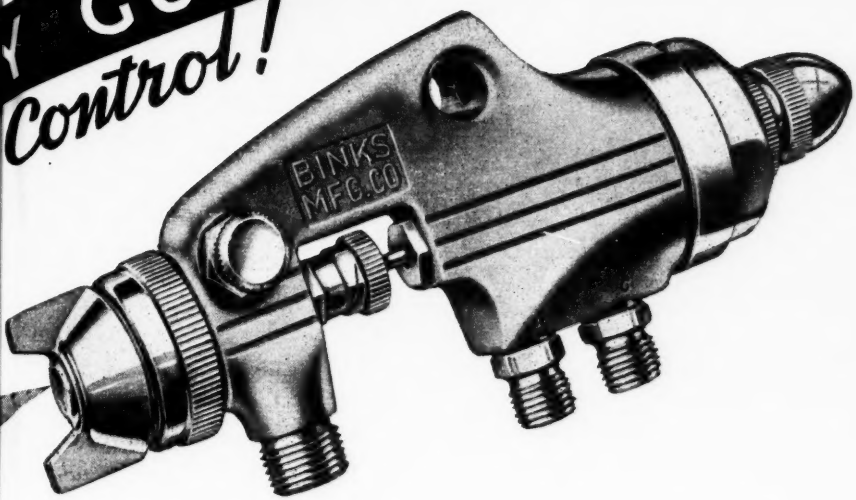

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Binks SPRAY SYSTEMS

Barrel Finishing of Metal Products

Continuing the discussion of current phases of barrel finishing.

By H. Leroy Beaver

IN the discussion for April covering current phases in the barrel finishing cycle, we could not include all of the points we wished to stress, and for this month we promised a further discussion relative to the factors involved in Rusted Burnishing Material and what to do with it; Barrel Liners; Effect of Underload of Burnishing Material and effect of too high a barrel speed.

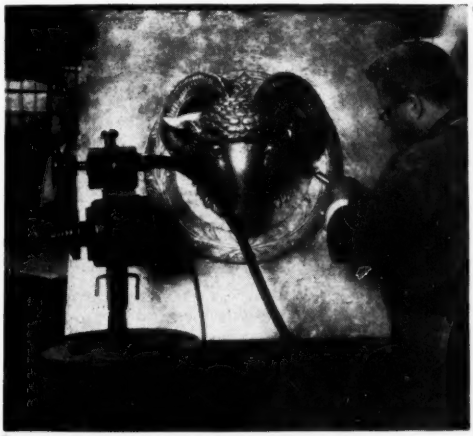
The reason these papers for April and May are termed "current phases" is simply because they are a discussion of conditions as your author actually found them in working conditions in plants visited covering quite a wide area of country during the past eight weeks.

The general conditions of rusted burnishing materials were entirely too prevalent to be attributed to accidental causes and could be ascribed to two things, either downright carelessness or lack of the necessary knowledge as to what is necessary to be done to keep burnishing materials in proper working condition. If steel burnishing materials are properly cared for there is no reason why we should find bright material in one plant and dull and lifeless material in another. We know of plants where by proper care of the materials they are as bright at the end of years of service as when new. There are many factors that enter into this question of burnishing material maintenance, but wherever we find a general rusted condition of the materials we also find that, through misunderstanding, the materials are not properly handled at the end of each day's run of work.

In all too many cases, the burnishing material after the last run for the day is simply permitted to lie in the unloading pan overnight with no protective covering of water whatever, and it requires only this length of exposure to assure at least the top layer of material becoming rust pitted. This would be bad enough for a single night, but when this practice is repeated day after day it can be easily seen that within a very short time the entire mass will be rust pitted. In one plant where ten barrels were being operated each with a nominal load of 1,000 pounds of burnishing material, we would venture to say that every single pound of this

material had at some time or another become rust pitted, and the operator complained that he guessed that barrel burnishing was not for him because he could not seem to get the results necessary for their work. Now if even 10 per cent of burnishing material in a mass has at some time become rusted, satisfactory results are very difficult to obtain, but with 100 per cent of rusted material, even what might be called purely nominal results are mechanically impossible. The replacement of as much as 10,000 pounds of burnishing material in one plant is entirely too much.

A rust pit on the surface of a burnishing ball or burnishing shape is an apparently harmless appearing thing, in most cases resembling a small or large brown spot or blur of irregular shape. To look right down on one of these rust spots with the naked eye discloses very little, and too many operators make the mistake of thinking that when this condition exists that all that is required to remedy it is to simply wash the material in kerosene or gasoline, which removes the brown rust spot and that once this is done the material is again perfectly satisfactory for burnishing purposes. No greater mistake than this could be made, for while it is true that such an operation will remove the iron oxide, it cannot in any way take care of the very sharp edges of the pitted area. If we could cut through any of these rusted parts and take a cross section view of them we would easily note that the rusted area has projections that are as sharp, and especially at the edges of the pitted mark, as the serrations of a sharp cutting file. No amount of washing in solvents that remove the rust spot will suffice to



The above photograph (courtesy of General Bronze Corp.) shows the finishing of a bronze casting, using a multiple speed Jarvis Flexible Shaft Unit to drive various shaped rotary files, sanding drums and small grinding wheels.

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clear this condition of sharp edges. When this material is used in a barrel burnishing operation, and especially so where the load is comparatively heavy, the pressure back of the mass causes these sharp edges to bear down on the surface of the parts being burnished, where this file-like cutting action easily becomes all too apparent, and satisfactory finishes are impossible of attainment.

There is only one remedy for rust pitted burnishing materials, whether they be balls or burnishing shapes, and that is to remove a sufficient part of the surface to eliminate the sharp cutting edges, especially of the rim of the rusted areas. This operation is, of course, best performed by the manufacturer of the burnishing material and the cutting down operation is, of course, only practicable on materials that have been hardened to a sufficient depth to permit this operation to be done without cutting through the casing of the materials. Plating shops or manufacturing plants operating only one barrel have no recourse but to go to the manufacturer of the materials and arrange for a refinishing operation.

In most cases, the burnishing materials can be reclaimed in this way and function as well as new materials. However, there are many cases where the materials have been so badly rusted that refinishing would be of little or no help, but this can be best decided by the manufacturer of the materials, and so in case, after close inspection you find that your burnishing material has at some time become rusted and cannot produce satisfactory results, our suggestion would be that you send a representative sample of about one pound of the material direct to the manufacturer who supplied it, asking whether it can be satisfactorily refinished. The cost of this work varies with the condition of the material. In some cases, the operation will involve only one step of the regular manufacturing process, while in others two or three steps may be necessary. If the cost for the work as estimated by the manufacturer involves approximately one-third of the cost of new material, then the operation would be a profitable one for the user of the material, but if the cost of refinishing involves more than half the cost of new materials this would mean that the materials have been too deeply pitted and in such case rejection of the rusted materials and replacement with new material would be the logical procedure.

Burnishing materials when properly cared for will not "wear out," and they should always maintain the same bright appearance if the most satisfactory results are to be obtained from their use. One of the most prolific causes for finding rusted burnishing materials in barrels is due to the fact that when burnishing material is spilled either in loading or unloading the barrel, it is not immediately taken up, but periodically is gathered up and then, instead of being carefully inspected to see whether it has rusted due to exposure, it is simply tossed in with the rest of the materials. Very often material lies on the floor in out of the way places for several days and then on "cleaning up" day it is all gathered together and simply added to the burnishing mass. This is the very worst procedure possible. If, on inspection of such material it is found to have become rusted due to exposure, it is far better to discard the spilled material rather than to "leaven the mass" with rusted materials that will only defeat satisfactory burnishing results.

In plants where batteries of barrels are operated it is often possible to refinish rusted materials by a com-

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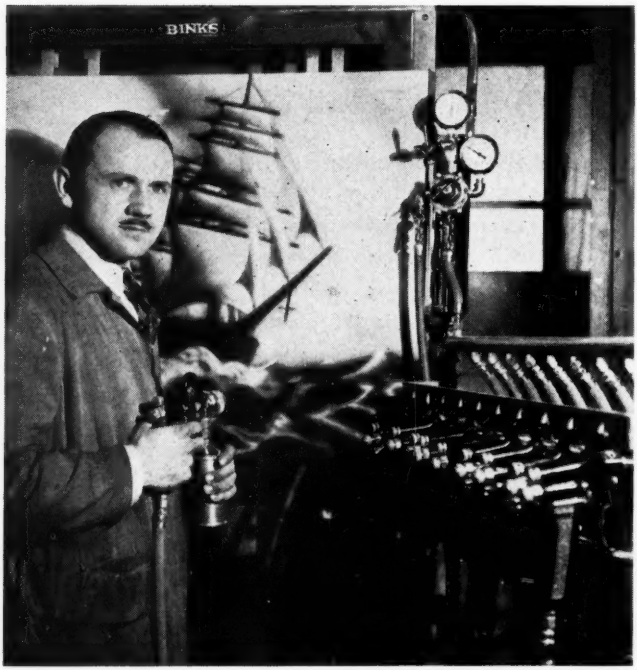
paratively simple operation which must, however, be performed in an unlined barrel. The procedure is to simply place a nominal load of the rusted material in the unlined barrel, cover it just to the surface with warm water, taking care to measure the quantity of water added in gallons. Then to each gallon of water, add one and one-half pounds of vienna lime (this can be obtained from any platers' supply house). It will be necessary to operate the barrel for anywhere from eighteen to twenty-four hours because vienna lime is a very slow cutting polishing abrasive, but in cases where the rust pitting is not too severe, this operation will often suffice to reclaim the material for satisfactory burnishing work. In an operation of this kind, the lime will gradually thicken in the mass due to final slaking and the barrel should be vented, but if it does not contain a regular air vent then the lid should be loosened about every half hour during the operation to permit the exit of accumulated gases that build up in the operation.

At the end of this operating time, the material should be comparatively bright and the sharp edges of the rust pits worn down so that they will not scratch the work in process. The lime solution should then be carefully washed from the barrel, another charge of warm water and soap added, which will remove the balance of lime on the surface and the material can then be returned to the regular wood lined burnishing barrels for the regular burnishing procedure. If this comparatively simple operation will not sufficiently reclaim the material,



Artist Stops Crowds at Shows

ERNEST F. WATTS, advertising and sales promotion manager, Binks Manufacturing Co., 3114-40 Carroll Ave., Chicago, Ill., discovered a unique talent for painting landscapes and seascapes hidden away in the Michigan North Woods, in the person of Ralph De Gayner, of Iron Mountain. The artist's unusual technique is now used as a sales promotion stunt to show the exact control of a large production spray gun which he uses to paint pictures in from five to seven minutes. The illustration shows a close-up view of the artist while working on an old-fashioned clipper ship and also his rig of ten different Binks spray guns, each with a separate color cup.

then the only thing to do is to return it to the manufacturer for more complete reprocessing or else discard it for new materials.

Now rust should not be confused with the brown or grayish cast sometimes found on burnishing materials caused by the formation of insoluble lime soaps on the surface of the materials due to the use of hard water that has not been reduced to soft and an improper soap. Such lime soap formations on the surface when combined with rust will be removed by the vienna lime refinishing process. Where the difficulty is, lime soap deposit alone, without an accompanying rust pitted condition, then the lime soap may often be dissolved by the use of a 3 per cent solution of tetra-sodium pyrophosphate, but it is far better to prevent the formation of such insoluble soaps by following the procedure as outlined in the April issue of PRODUCTS FINISHING, than to have to resort to chemical means to remove them after they have formed.

We have been asked to further discuss the question of barrel liners and to say what in our opinion would be the effect of using liners made from sappy yellow pine instead of the customary hard maple. We might simply state that the barrels themselves of the Tahara Silver Burnishing Machines in the larger sizes are made from this material, and these are the most highly developed burnishing barrels now in use. There is no objection to the use of sappy yellow pine liners instead of rock maple liners either in the flat or as end grain liners. The confusion in this regard has arisen by confusing liners with sawdust. Generally the sawdust from yellow pine is not satisfactory for use in drying operations following burnishing for the reason that when, in a very fine form, the gums and

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pitches in this wood will adhere to the surface of burnished parts, and especially so when they are rinsed with hot water and then immediately placed in a sawdust drying out barrel or heated sawdust tray. The pitch so deposited is very often quite difficult to remove and presents its own difficulties in the plating cycle, but this condition does not apply where sappy yellow pine is used for barrel lining material.

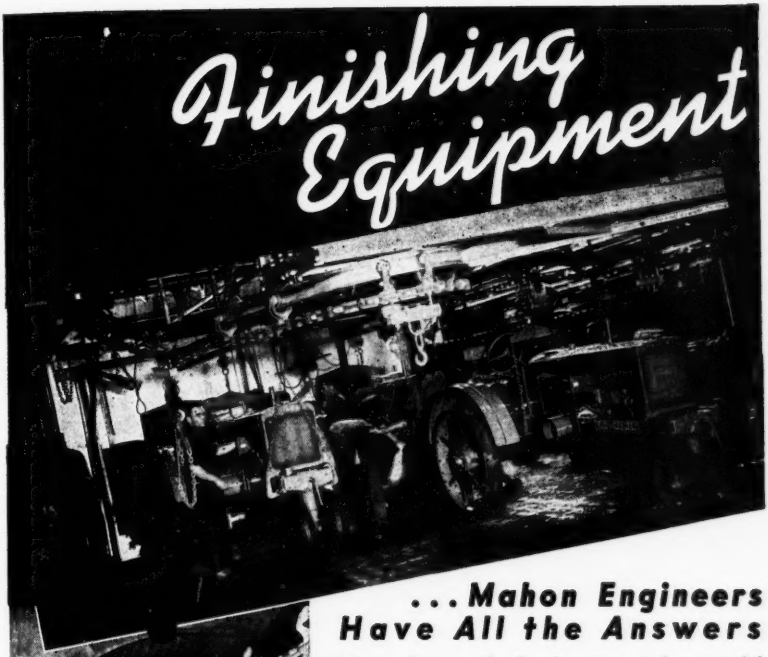
There is only one precaution necessary and that is when the liner is installed and before burnishing operations are started in the barrel, it is well to place a charge of water and sodium hydroxide in the barrel, a 4 per cent solution will suffice, and this will prime the barrel for regular burnishing work. The question of which will give the longest service, pine or maple, is always open to controversy, and indeed, the life of any liner irrespective of the wood used is largely directly related to the type of materials handled in the barrel. Stampings having sharp burred edges will naturally cut down a liner far faster than more regularly formed pieces. Ordinarily, pine liners are not so liable to warp as maple liners, and perhaps closer fitting of the liners can be practiced than with maple liners. As to the thickness of the liners, having in mind the theory of using a ¾-in. liner instead of a 1½-in. liner to gain greater barrel capacity, we would say that this might be practicable in open end types of barrels, but in closed barrels this is of doubtful value due to the expense of taking down the barrel for liner replacement where the loss of operating time is often and indeed in most cases a sufficient factor to warrant the use of the thicker liner. Then, too, a ¾-in. liner will not remain so solidly in place as the 1½-in. thickness.

The question of underload on burnishing material as operated in the average barrel is an important one. Very often in a barrel requiring a nominal operating load of, say 600 pounds of material, the load is permitted to dwindle until it is necessary to purchase anywhere from two to three hundred pounds of materials to bring the barrel back to its proper capacity load. Too many operators lose sight of the fact that it is not the rolling of the burnishing material across the face of the parts being burnished that produces the finish, but rather the pressure developed within the burnishing mass as it flows around the center of the axis of the barrel.

The element of pressure is important and the barrel manufacturer builds his barrel for the definite purpose of having it carry sufficient material to provide the necessary burnishing action. It is quite true that a bright finish can be obtained with a comparatively light load of burnishing material, but in doing only this we disregard the principal purpose for which barrel operations are conducted and that is to so harden the surface by a cold working process in a barrel whereby we alter the degree of plasticity of either the basis material or the material coated thereon and in this operation close the pores against corrosion or harden the surface to provide for greater resistance to wear and in attaining these conditions, the polish or burnish is only an accompaniment of the prime purpose of the operation and not the ultimate purpose. Light loads, it is true, will give a surface polish or burnish, but it is only in a superficial way and in much the same sense as we would shine a pair of shoes.

In connection with the matter of underload of burnishing material, we

Finishing Equipment



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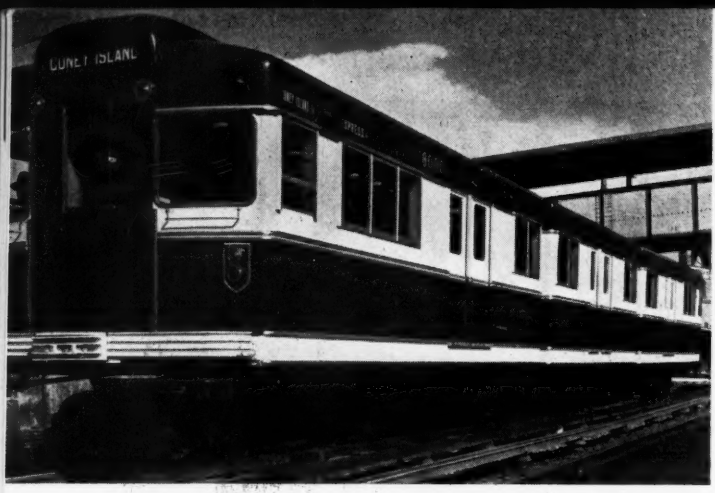

Straphangers' Luxury Liner

SHOWN here is the Clark Equipment Company's, Buchanan, Mich., new rubber-sprung streamlined subway and elevated car as it is pulling out of a tunnel in the BMT system in New York, where it was recently put into service. Aluminum-bodied, the car gleams with blue and ivory paint, set off with natural aluminum moldings and red stripes.

must also consider the element of speed. With full loads, higher speeds can be maintained than in cases where the barrel is much underloaded. In most cases where an operator starts with a barrel at full load capacity he knows that even following the common basic practice of using two parts of burnishing material to one part of parts to be burnished he has none too much burnishing material to properly envelop the parts being burnished. Now as the load dwindles down through losses due to spillage or other causes, he generally forgets that his load is smaller and continues to add the same quantity of parts as he did when the burnishing material was up to full load, until he gradually reaches the point where his parts come from the barrel either scratched or permanently deformed due to insufficient cushioning of burnishing material. Either this or else his finish finally becomes worse and worse until he reaches the point where he discovers for himself that his trouble is all due to insufficient burnishing material to properly perform the operation.

We do not recommend or advise that any operator carry in stock a large quantity of highly polished burnishing materials. There are too many reasons why this should not be done but principally the materials are not properly stored and due to moisture in the air will often rust in storage. It is very much better practice to check your burnishing barrels every three months and then estimate the quantity of material required to bring them up to their normal and best operating load capacity, and then order just that quantity from the manufacturer. You can always remember that irrespective of size or shape, burnishing materials will average 12½ pounds to the quart or 100 pounds to the peck and in this way the average operator can gauge closely enough the quantity he will require to add to his burnishing mass to bring it to full load. Orders for as small a quantity as 25 pounds of burnishing material are acceptable to all of the burnishing material manufacturers, and there is no reason why any operator should be operating his barrels under any save the most satisfactory conditions. Indeed in those cases where we are regularly retained as a consultant we insist on this procedure being followed because experience has taught us that it is only by operating barrels under full load conditions that we obtain the maximum of burnishing results which

the maker of the barrel expects the users of his barrels to attain.

The practice in some shops of reducing the proportion of burnishing materials in times of forced production so that larger quantities of parts can be operated upon per load cannot be too seriously condemned. It is always far better to have too much burnishing material in the barrel than not enough, and in such cases also far better to add one or more barrels to the equipment than to resort to such expedients.

Technical Books. A new 36-page catalog of technical books has just been issued by Chemical Publishing Co., Inc., 148 Lafayette St., New York, N. Y. This catalog covers domestic and imported books on chemistry, physics, mathematics, medicine, metallurgy, machinery, engineering, biology, general science, business, manufacturing, formularies and technical dictionaries.

A copy will be sent to anyone interested upon receipt of stamps to cover postage.

Jarvis Catalog M. S. T. of Flexible Shaft Driven Power Tools. The complete line of Biax and Jarvis Flexible Shaft Machines, together with accessory equipment and tools, are presented in a 28-page catalog, 8½ x 11 in. in size, now being distributed by The Charles L. Jarvis Company, Middletown, Conn. Included in the equipment are the Multi-Biax bench type, floor type, overhead trolley type, and overhead saddle type flexible shaft machines, Supra-Biax roller floor and overhead types, and the Jarvis Vario-Flex machines, single speed machines, Jarvis screw and nut setters, and Jarvis screw drivers. Jarvis self-contained shafts for your own motor are also included.

Among the accessories presented are Jarvis right angle gears and hand-pieces, accessories and tools, and sanding drums, buffs, steel wire brushes, grinding wheels, and the complete line of Jarvis-Biax hand cut, mill cut and ground rotary files, routers and rasps.

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How Should the Finish Be Applied?

The author presents interesting information on new and improved methods of applying coatings to metal products.

By E. A. ZAHN
Works Laboratory, General Electric Company

FINISHING equipment of the proper type for each finishing application is an essential point in progressive work. Without proper equipment neither the skilled operator, nor the tailor-made painting materials can accomplish their part successfully. Here we can be guided by the automotive finishes inasmuch as that type of workmanship is most certainly one of the most important in the world. Everyone who buys a new car wants others to admire it and speak about it. The equipment used to apply automobile finishes must be of the very latest design and highest quality, and must be capable of performing almost continuously without failure. To accomplish this, the operator realizes that there is only one way in which to keep his end up, and that is to care for the equipment according to its importance in the finishing schedule. A good spray gun is very important in automobile finishing, since it takes thick, sticky-looking material and lays a beautiful, uniform film on a surface.

A great deal is accomplished by just pulling the trigger of a spray gun, and so a lot of damage can be done unless the man who pulls it knows his business. On some types of work the operator is not allowed to see the finishing material until it comes out of the gun. The finishing material is centrally mixed and distributed through pipe lines to the various spray booth for application. Even the spray gun adjustments are locked to avoid tampering and faulty adjustments. The work is passed before the operator at a predetermined speed, a speed over which the operator has absolutely no control. Under these conditions, very little error possibility may be found so far as the mechanical equipment is concerned.

After all this, one might think that there was little else for an operator to do, but even so the operator must be well trained to do a real finishing job. The automotive manufacturers realize this only to well, for without an attractive finish, a certain amount of customer attraction is eliminated, and without customer attraction and purchasing, operations would have to be stopped.

Back as far as the varnish brush finisher of automobiles, the care of equipment was of decidedly great importance. The varnish which was used was no cleaner than that which is applied to floors, but the finisher's brush was different. The brush selection was an art in itself, but the hours spent in selecting a finishing

brush was nothing compared to the hours spent caring for it and working it in. The beautiful varnish finished old cars were finished by brushes in the hands of real craftsmen who really knew their business and without them an automobile manufacturer was without production. They knew it only too well, and often made life miserable for the manufacturer by threatening to quit for little or no reason at all.

There were other even more highly valued men then, and we still have a few now. Those who could make things look more beautiful by putting on a near perfect stripe for greater customer appeal.

Mechanical equipment has replaced these men almost entirely, not because they were temperamental, but because they made things so beautiful that the public demand became too great for the work which was produced by such slow methods.

Today we have a very similar problem regarding equipment, but it has been made far more adjustable. In selecting a spray gun, it is not so much a point of a manufacturer's name, as it is the type of gun, so long as it is a reliable make.

If it is a problem of selecting equipment for materials similar to the automotive type for application on some other lines of apparatus, there is a very easy way out. A safe selection can easily be made by copying from the automobile manufacturer himself, for he has long since had the grief and expense of finding out which is the best type and suited for high grade work.

Some spray guns have so-called atomizing chambers in which the materials are mixed through a swirling action of air and paint inside of the chamber. In this type of gun the air and paint mixture leaves the nozzle in that mixed state. Another type of spray gun atomizes the paint outside of the gun nozzle. The paint leaves the gun in a liquid state and is immediately caught up by a volume of air that leaves several jets around the liquid opening. The air and material may be controlled to form nearly any spraying pattern with either type of gun.

There are many different makes of spray guns available on the market in either type. Some spray guns incorporate engineering features which are protected by patents, but other

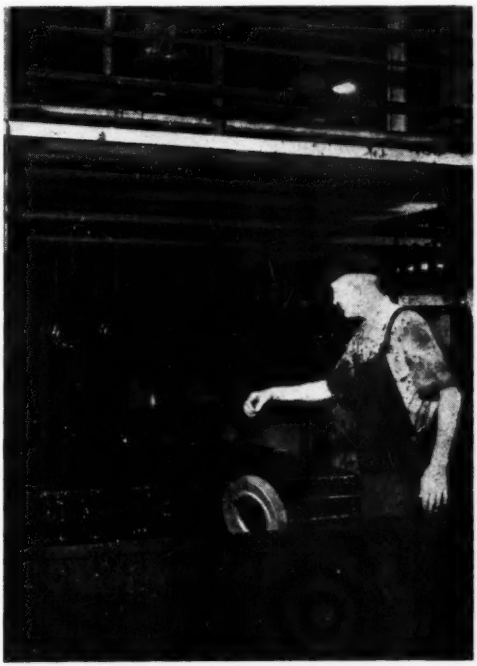

Fig. 1—Each piece to be finished is carefully dipped into the finishing material tank shown in the foreground and then hung on the oven conveyor located above the tank.

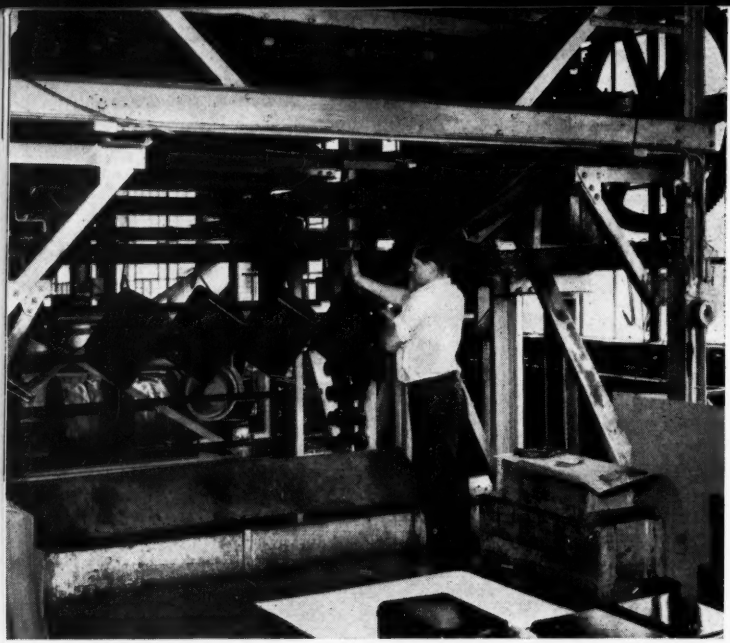

Fig. 2 — The workpieces that are placed on the crossbars of the conveyor shown here are automatically dipped into a tank of finishing material prior to being carried through a drying and baking oven.

makes which have a large number of desirable features are preferable from a standpoint of durable construction.

In selecting a spray gun, one should keep in mind that efficiency is of utmost importance. The gun must first be capable of producing a clear, smooth coating on the surface. It can then be examined for its ability to perform uniformly with constant use. Gun speed is secondary to the quality of the finish produced. There is a definite place for each type of gun just the same as there are many material types which are of the coarse or penetrating type and where speed is a more essential factor. The material, in these cases, has the advantage of smoothing itself.

After the gun has been selected and put in use, the care given to it is very important and very often neglected. Considering the cost of the gun in comparison to the cost of an ordinary paint brush, this alone would call for more care. A dirty spray gun would possibly perform better than a dirty paint brush, but it would do far better if it were cared for and kept in good condition.

It is not always advisable to spray materials which are designed for some other method of application. Fillers can be sprayed in nearly any consistency, but these fillers have to be sanded smooth eventually. The purpose of the filler is to fill in low spots, and if the deepest of these were glazed first, and a smooth, lighter coating sprayed afterwards, there would be much less waste than if all the filler were sprayed. There would also be less labor of sanding.

The amount of compressed air required for proper application is directly proportional to the efficiency of the spray gun. Some guns are not capable of very fine atomization at any pressure, while others will spray efficiently at pressures as low as 25 pounds. Excess air pressures induce waste of paint materials and they do not add sufficiently to the speed to compensate for the wasted material.

Some spray equipment manufacturers have a regular school for training their men and offer courses for

the training of employees of concerns who use their equipment. For the ordinary man, a three weeks' training course in the spray equipment manufacturer's plant should qualify him to make intelligent selections of spray equipment for various applications and also to service regular equipment in his own plant.

A very efficient and inexpensive service kit could be maintained at some central point in a plant for servicing spray guns and changing them to correspond with the various spraying material requirements.

Automatic spray equipment has become quite popular and is in use on a great number of applications. This proves to some extent that the equipment itself is capable of producing high class work without hand operators. However, automatic installations can only apply to the mass production of pieces of uniform construction. Spraying materials for use with automatic spray equipment must be tailor made and nearly perfect in performance. The guns and the paint are the two most important factors. The rest of the apparatus can be flexible enough to allow adjustments of almost any description. Some of these machines are almost human in operation, as they can see the parts by means of an electric eye in order to stop or start spraying at the proper time. There should be sufficient production involved to warrant the expenditure for automatic equipment in order that it can pay for itself in a reasonable length of time. It is important to remember that even a slight change in the design of the production piece being finished can sometimes make a very expensive piece of equipment obsolete. On well designed apparatus, where a proper selection of viscosity instrument has been made, it is possible to control a deposited film thickness

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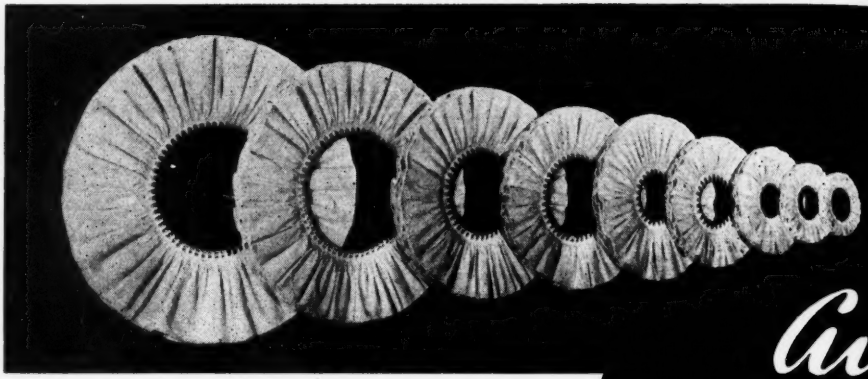

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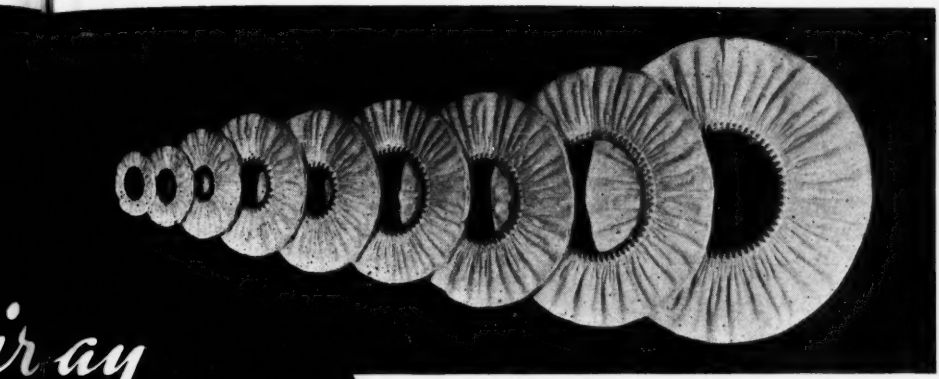

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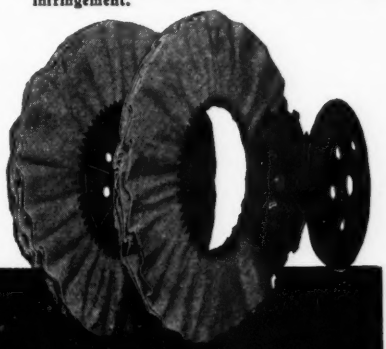

An Attractive Finish

Shown herewith is a Westinghouse two-tub model of deluxe design, equipped with a deluxe Fabric-Saver wringer, nickel-chromium protected aluminum Fin-Flex agitators and all-white porcelain enamel tubs, mounted in a special rigid, white base finished with high-baked Permalux.

very accurately.

Many times it is very difficult to automatically spray recesses and hidden corners, particularly where they do not entirely surround the object being sprayed.

Small parts which are to be assembled inside of larger pieces of apparatus can be finished automatically in any economical way, provided that the method provides the necessary protection for the hidden parts. When the small parts are being finished for protection, they can be finished for appearance just as easily.

The automatic dipping machines are a near human piece of machinery which is capable of applying a beautiful, smooth finish. The only attention required is the loading and unloading operations. Behind the scenes, however, is the care and the real operation of the equipment. Unlimited features can be incorporated to include cleaning as well as finishing. On some of the available equipment today the finished parts travel over a circuit which brings them back to be unloaded by the same operator who loads them. Is it any wonder, then, that these machines can paint many tons of work in an ordinary working day when the only principal requirements are loading and unloading? Paint storage tanks which have a capacity of many hundred gallons are a part of the regular equipment. These storage tanks are connected by pipe lines and pumps which in turn take care of the agitating problem by circulation. In some cases cooling jackets are installed along the pipe lines in order to control the paint temperature within certain limits. The hazards involved are generally in direct proportion with the care used with the equipment construction.

One of the more common causes of failure in production is the operator's failure to exercise enough control over the viscosity of the material. There are viscosity instruments available now for checking the viscosity very quickly which do not re-

quire skilled operators for handling. In some cases automatic viscosity control is a built-in feature of the dipping machine.

The control of the material in connection with automatic dipping equipment is of utmost importance. After a tank is once filled and has been in use, there must be some means by which an operator can take an accurate reading of his mixture. He must know exactly how the contents are in relation to the requirements. To do this successfully, viscosity determinations must be employed. While there are many types of viscosimeters which are capable of giving accurate readings, there are some which are particularly made for use with automatic dipping machines. These instruments remain suspended in the liquid until a reading is taken and can then be placed back into the liquid without the customary cleaning. There are no glass parts involved which might become broken. One of the most desirable features of the new types of viscosimeters is the ease of operation. Some viscosimeters do not require special training of an operator. The time involved in an accurate reading is only from 10 to 20 seconds. The use of these instruments is by no means confined to dipping materials and they are being used in great quantities for viscosity control of many different liquids. The temperature changes in dipping materials is directly related to viscosity control and the fact that a viscosimeter can be constantly in contact with the material leaves little or no error possibility from this angle. The temperature of the dipping material should be controlled between certain working limits and the temperature of the parts being dipped should also be controlled in order to

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allow the material to perform properly. Some of the more modern dipping units combine degreasing equipment, dipping, and baking ovens in a surprisingly small space. The location of the necessary equipment is generally in direct line with the sequence of operations according to the product being manufactured.

Automatic dipping is perhaps the most economical way in which to apply a finish. On a successful dip application, where there are no runs, dirt, or hanging drops, the finished appearance can be exceptionally attractive. In fact, it could be easily called the "ideal' finish from a standpoint of appearance. The paint material manufacturer is probably more responsible than anyone else for the successful application of paint by this method.

There is in reality no limit to the size of the parts which can be dipped. The common problems seem to arise generally from material types rather than from the parts being dipped. Manufactured parts having intricate design, such as louvres, expanded metal panels, and corrugations can be and are being successfully dipped. It is when a certain specified material, having specially formulated characteristics is used that trouble arises.

Black materials lend themselves to dipping more readily because of color. Any tendency to silk or mottle, or even pigment floatation is hardly noticeable in the black color. This is particularly true of the high gloss type.

The success of this type of application, so far as neatness is concerned, depends largely on the equipment used. While it is true that a good-looking job can be done by hand, with little or no equipment except a dip tank, this reference is being made more directly to the large automatic installations. Although, even the little tank used for hand dipping is a very important piece of equipment. It must be kept clean at all times, and above all, the material in it must be controlled continuously.

Flowcoating is in reality very similar to dipping excepting that in this way it is possible to coat one side of the object instead of both sides. The results should be the same as a fast drawn-out or hand-dipped application. As a rule, flowcoating paints are designed to correspond to the dipping type, and as in dipping, there is no limit to the size of the parts which can be coated.

There are flowcoat guns available which have an adjustable slot which can be gauged to fit a number of different material types. One of the greatest advantages is that one side of an object can be coated without loss of material as in spraying. The parts can be carried on a conveyor in front of the operator, and the application is very much similar to spraying. Instead of atomizing the material with air, it is simply flowed on the piece and the surplus allowed to drain back into a pump which is equipped with filtering and circulating devices. In this type of application, the viscosity control of the material is just as important as it is with dipping. Perhaps it is even more so due to the fact that more of the material solvents are exposed to the air. Most generally there is a regular gear pump used which simply forces the material up to the gun. This eliminates the necessity of a pressure tank for this kind of application.

"Roofs with Just Good Sound Horse Sense" is the title of a four-page folder describing Longlife roof coating which is manufactured by Flexrock Company, 23rd and Manning St., Philadelphia, Pa. Unretouched photographs are used to illustrate several applications of Longlife pure asphalt.

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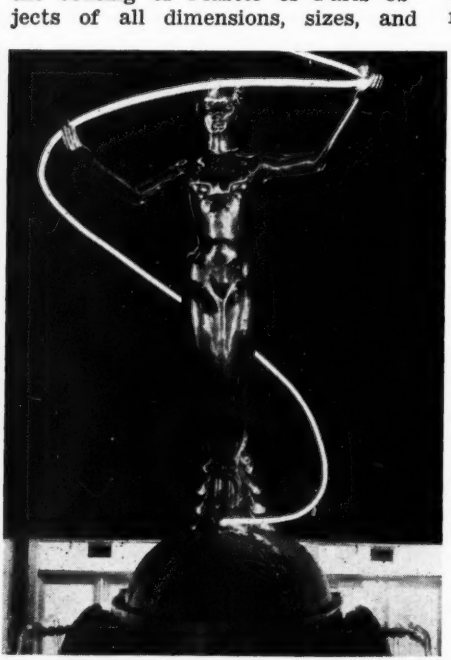
Finishing a Metalsprayed Statue

By P. LEDER
Metalspray Company Inc., Los Angeles, Calif.

SINCE Metalspraying has become a distinctly individual industry through its own efforts and also with the collaboration of other industries, a great deal of effort has been made to increase the radius of its scope, and when Metalspray engineers perform work that is exceptionally outstanding they are glad to inform those interested regarding its history. One of the most unusual innovations of the Metalspray industry has been the coating of Plaster of Paris objects of all dimensions, sizes, and shapes. Metals and alloys of metals of all descriptions that can be obtained in wire form have been used to create different effects and finishes.

This illustration shows the beautiful results obtained after an object has been Metalsprayed and finished. The figure is a 7 ft. 6 in. plaster statue which has been coated with Tobin Bronze by the process of Metalspraying. After the Metalspraying, it was highly polished. The statue stands on a 3 ft. 6 in. base, which forms the roof of the box office of Earl Carroll's ultramodern theater restaurant in Hollywood. The white band winding around the statue and curving to the ceiling is a burning Neon tube, which encircles the vast patent leather covered ceiling.



Seven ft. six in. plaster statue which has been coated with Tobin Bronze by the process of Metalspraying and then finished with abrasives.

Plaster of Paris castings were made, well dried (Plaster of Paris can either be dried naturally or dried by baking), and assembled on the location where it will remain permanently, that is, in the entrance of the super-streamlined theater, where it immediately attracts the attention of every patron.

After thoroughly cleaning the Plaster of Paris with abrasive paper, not too strong in its cutting

effect, the engineers of the Metalspray Company Inc. began the process of changing the snow-white plaster figure to a shining golden bronze. The sprayed molten metal was applied as follows:

First a bonding coat of zinc, approximately .006 in. in thickness. This required 24 lbs. of ⅛ in. zinc wire. Next the application of Tobin Bronze to make a thickness of .040 in. This thickness of bronze was applied to allow ample metal for grinding and polishing to the high lustre desired, in this instance for carrying out the decorative effect. After Metalspraying, the statue was mechanically sanded with an electric hand grinder, using 60 grit and 7 in. diameter emery discs, which were baked by ½ in. thick felt.

After the emery polishing of the Metalsprayed surface, tripolis and rouge on rag buffing pads were used, the final finish being obtained with chalk. In order to maintain the high lustre of the polished metal, wax was applied, this being more suitable than clean lacquer and to meet the requirements of the decorating engineers.

As the Metalspray operators had to work from scaffolding and under artificial light, the time in which the statue was finished could easily be considered record time. The electric polishing equipment must be credited with expediting this job.

Below is given the number of hours used in Metalspraying and finishing the statue:

	Hours
Placing in position and cleaning	5
Coating with zinc	2½
Coating with Tobin Bronze	6½
Sanding	8
Buffing	7
Finishing with chalk	4

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Drying Methods for Japans, Lacquers, and Other Metal Finishes

The following article is a condensed report of a paper read by the author at the Cleveland Industrial Gas Sales Conference.

By PAUL J. ZIEGELBAUR
Pontiac Varnish Co., Pontiac, Mich.

THE past 15 or 16 years have witnessed revolutionary changes in the finishing materials and methods as applied to nearly every manufactured article from toys to automobiles. Prior to that time practically all finishes were of the ordinary cleoresinous type, composed of pigments, natural resins, linseed or china-wood oil, driers and thinners, using formulas that were originated in the days of hoop skirts. With the exception of black japans, these finishes were either air-dried for periods of from a day to several weeks or were given an overnight forced drying in a room heated with steam coils.

Paul J. Ziegelbaur

The various lacquers and the many types of synthetic finishes, with their well-known advantages, have all been developed since about 1923 when the Oakland Motor Car Company first used Duco in finishing its car bodies. The intervening years, from that first break with horse-and-buggy methods up to the present, have stressed so many changes and improvements in materials, application, ovens, baking time, and heating methods, that several volumes could be written in recording them.

The history of the development of ovens and heating methods closely parallels the development of finishing materials, preceding the latter, however, by some seven or eight years due to the necessity of finding better and faster ways of baking black japan on automobile fenders and other parts.

As far as we know, the first conveyor oven ever built was constructed by Mr. Henry Ford in a building on the corner of Woodward Avenue and

the Boulevard, in Detroit. It was in 1915 or 1916, and the oven was heated by gas burned in pipe burners.

Shortly afterwards, a monorail type conveyor oven was built in the plant of the old Michigan Stamping Company, now the Briggs Manufacturing Company. It is understood that this oven was not very satisfactory.

The first conveyor oven used in regular production, baking black japan on fenders, was built at the Hudson Motor Car Company in 1917. It was the first oven ever built to incorporate the principle of the air seal at the entry and exit openings. This oven was also heated with pipe burners, with the products of combustion passing through radiator tubes mounted on the walls of the oven.

The well-known "A" type oven was developed about 1919-1920. Mr. E. F. Collins of the General Electric Company is given credit for its development. The oven was designed around an ideal time-temperature curve for the baking of japan, and its characteristic shape was the logical result of studying such a curve. These ovens were known as compensating ovens, due to the discovery that air could be made to flow through them in a direction counter to the movement of the work, picking up heat from the work leaving the oven and delivering heat to work entering the oven.

The electrically heated "A" type oven enjoyed several years of popularity. About this time, the oil-fired, indirect type of external air heater was developed by Laurence, Harrison and others. These external air heaters produced results equal to electric heat and were comparatively inexpensive to install and operate. So, commencing about 1920 or 1921 large numbers of the oil-fired heaters were installed in existing and new ovens.

The year 1928 found most of the large and important oven installations heated with either oil or electricity. Gas, which in the earlier days was almost universally accepted as the fuel for heating japan ovens, has been displaced except in box ovens and a very few other jobs that the oil or electric man hadn't gotten around to. The development at that time of the gas-fired recirculating type of air heater was a means of restoring to gas companies a considerable load that had been lost, and has enabled gas to become a preferred fuel for heating all types of ovens.

The writer well remembers the arguments encountered when he first tried to introduce the idea of heating an oven with hot air mixed with the products of gas combustion together with recirculation back through the heater. He was told that it would blow up, that incineration of oven fumes would produce soot, that the products of combustion were

injurious to paint, that the paint wouldn't dry unless the products of combustion were kept out of the oven, and so on. Today, many hundreds of these heaters are in use all over the country, and not one of the arguments against their use has ever proved valid.

Gas, burned in these heaters, is being used to dry the most delicate lacquers and to bake the roughest japan. Oil type finishes and an infinite variety of synthetics are baked with equal facility. Gas heat can produce a wrinkle finish, or be adjusted so that there will be no wrinkling when it is not desired. The products of combustion of gas have no effect on any color, and gas burned in recirculating heaters is being used to dry lacquers and synthetic finishes in colors ranging from the purest white through the pastel shades to all of the solid colors.

One argument that has been advanced by paint men against the use of the recirculating heater is that the products of combustion mixed with air cuts down so much on the oxygen content of the mixture that the paint won't dry as fast as in an oven where there are no products of combustion. The following calculations will prove that these arguments cannot be substantiated in fact.

Assume a moderately sized oven requiring a delivery of 10,000 cu. ft. of air per minute at a temperature of 500 deg. F. The combustion of 46.7 cu. ft. of 1,000 Btu natural gas per minute is required to produce the necessary heat. The products of combustion will amount to 490 cu. ft. per minute, composed of 354 cu. ft. of nitrogen, 89 cu. ft. of water vapor, and 47 cu. ft. of CO_2. The mixture entering the oven will have the following composition:

1,997 cu. ft. 0_2	19.97 per cent
7,867 cu. ft. N_2	78.67 per cent
47 cu. ft. $C0_2$	0.47 per cent
89 cu. ft. H_20	0.89 per cent
10,000 cu. ft.	100.00 per cent

Whereas air contains 20.9 per cent of oxygen, the above mixture contains 19.97 per cent, a reduction of less than 1 per cent. Since the quantity of air required to carry the necessary heat into the oven is several times the amount needed for the actual drying of the paint, it follows that the presence of combustion gases will have no effect whatsoever on the drying time. As far as the water vapor is concerned it can be shown that the water vapor added by the products of combustion amounts to less than a 2 per cent addition to a 50 per cent relative humidity at 70 degrees F.

The use of recirculation with the gas-fired air heater is very important from the standpoint of efficiency, and operating cost, and should be employed to the fullest extent. Many operators have been timid about utilizing the possibilities of recirculation, and are simply wasting heat when they do not use it. It is possible to recirculate as high as 85 per cent of all the air delivered to the oven when baking certain types of black japan. With lacquers and synthetics the recirculation must be reduced to about 50 per cent and sometimes a little lower. This is especially true if the paint contained improperly cooked china-wood oil.

The baking of finishes on manufactured articles seems quite a simple process to the uninformed person. One simply coats an article with paint, shoves it into an oven and after a suitable length of time takes it out finished. Many of us have often wished that it were as simple as that. Actually, the baking of japans, lacquers, and enamels is nearly as complicated as solving a mathematical equation containing four variables.

There are four factors involved in the baking operation. The first is the object to be finished. Variations in shape, size, thickness of various sections, condition of the surface, and so on, have an important bearing on the finishing of the piece. The location of holes or sharp edges or corners presents a problem that is sometimes difficult to solve. For example, the hole cut in the rear fender of the newer cars for the gas tank-filler pipe required a change in japan dipping viscosity, a new hanging position on the oven conveyor, and a change in the baking cycle in order to get satisfactory results.

The second factor is the finishing material. It must be of the right type, made of the best materials and held within close limits to a specified standard to produce the desired results. If the paint is not right, a good finish cannot be had.

The third factor that affects the forced drying or baking process is the oven. Ovens are more than heated enclosed spaces. They are machines, as precisely designed and closely adjusted as a machine tool. Unless designed by experts and built and adjusted by experienced oven engineers they can be a source of continual annoyance.

The gas load involved in baking finishes is a considerable one. It is estimated that the annual production in the United States of primers, lacquers, enamels and japans that are baked or forced dried amounts to between 200,000,000 and 300,000,000 gallons in a normal year. This estimate is probably conservative. If all this material were dried in gas-heated ovens, the annual gas consumption would amount to over 24 billion cu. ft. of 530 Btu equivalent gas.

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Pickling in a Modern Enameling Plant

The plant and methods used in the works of Sidney Flavel & Co., Ltd., Leamington, England, are described herewith.

THE standard of enameling on present-day domestic cooking ranges is much higher than it was some years ago. This is due to various factors, notably to more careful preparation of sheet metal surfaces before enameling.

Pickling is one of the key processes in preparing sheet metal for the enamel shop, and is now usually carried out under scientific control. In the works of Messrs. Sidney Flavel & Co., Ltd., Leamington, England, one of the oldest manufacturers of cooking ranges in this country, the straight line system is employed.

The majority of the work going through consists of sheet iron components of gas cookers which, before coming to the pickling department, have passed through the inspection room. Defective sheets have, therefore, been discarded and the work can be put in the crates immediately. The loading of crates is carried out in such a way as to give ready acid access to all the pieces. In most cases this means all sheets are placed on edge.

Two degreasing tanks are available. These contain boiling trichlorethylene and all work passes through one or other of these tanks to ensure that all grease is removed before the crates are placed in the acid tanks. There are three acid tanks in use at the present time, and the pickling

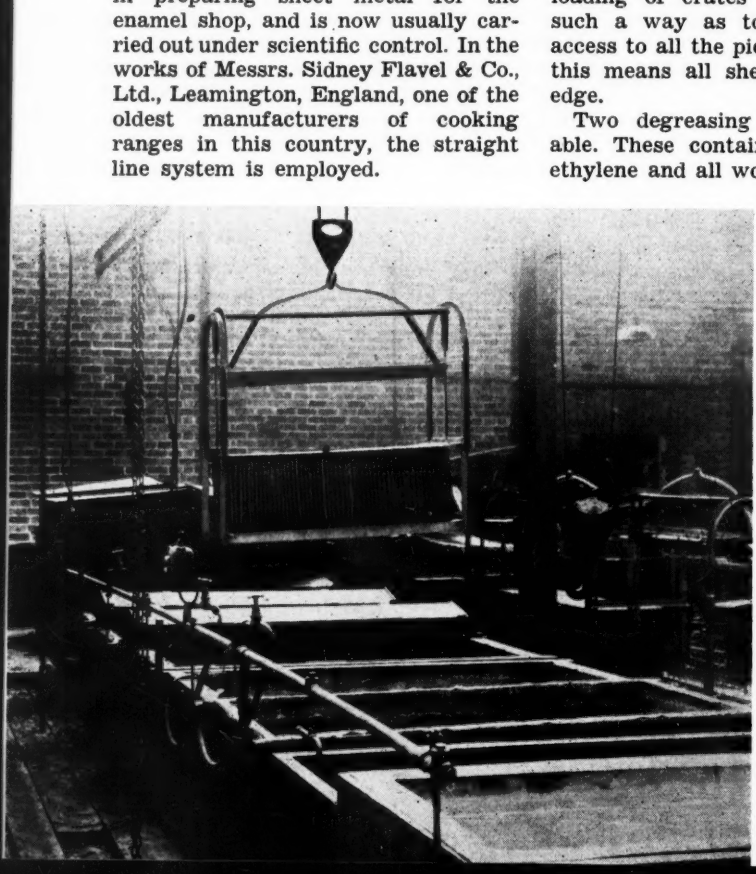


Fig. 1 — Illustration showing the pickling department. The crate of work is raised and lowered into the pickling tanks by means of an overhead conveyor.

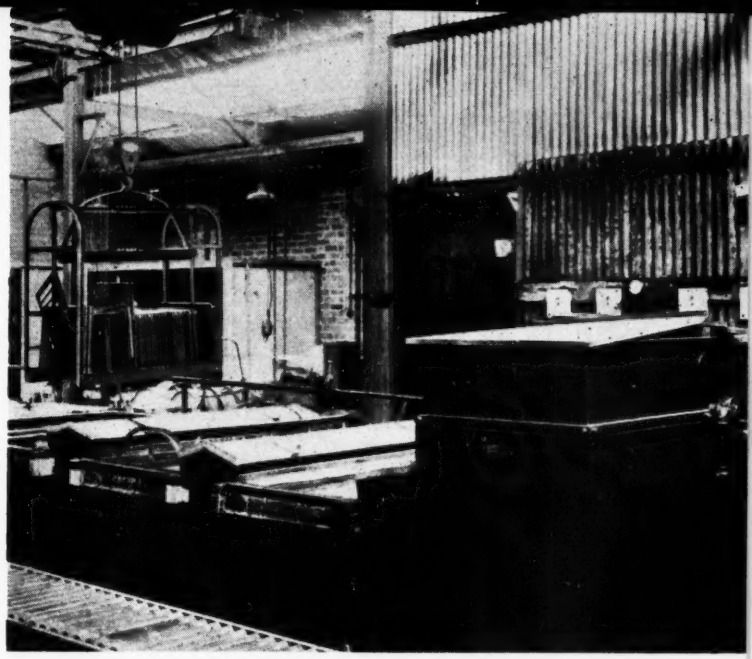


Fig. 2 — A view of the pickling department, showing a loaded crate before it is placed into an acid tank for pickling.

solution used is cold muriatic acid at about 11 per cent concentration. Fume removal equipment is installed on the acid tanks to protect the operators. The time of immersion in the acid varies, the work being left in the bath until it is free from rust and scaling. This is usually about 20 minutes.

After withdrawal the work is allowed to drain momentarily and then placed in a cold water rinse. Water used for rinsing requires frequent or continuous changing to avoid building up an acid content. To meet this need there is a continuous flow of water. All traces of acid must be removed in rinsing as far as possible to prevent the neutralizing solution being weakened and unwanted salts being formed in the alkali tank. If left on the ware, acid will cause enameling difficulties. Two tanks are available for rinsing.

Neutralizing is carried out in the final tank in the line, the solution employed being composed of soda and water maintained at about 150 deg. to 160 deg. F. The heat promotes rapid interaction between the acid contained in the pores of the metal and the alkaline bath, and ensures that the last traces of acid are neutralized. After emerging from the soda solution the ware is drained and dried as rapidly as possible in a gas-heated air oven to avoid any formation of rust.

All crates used are made entirely from Monel and are of riveted construction. The first units were placed in service in 1933 and have given satisfactory service, the only trouble being of a minor nature due to failure of rivets through mechanical damage. No trouble whatsoever has been experienced through corrosion of the metal.

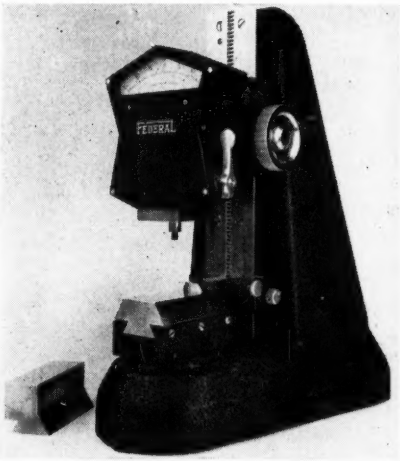
The hoods of the fume removal equipment are made of lead reinforced with Monel bar. This equipment has only been in use a short time and is entirely in "as new" condition.

The whole of the sheet metal work which is required in the production of Flavel stoves passes through this department and the care which has been taken to control the work on scientific lines is an important factor in obtaining good results in the enameling department.

(Reprinted courtesy Sheet Metal Industries)

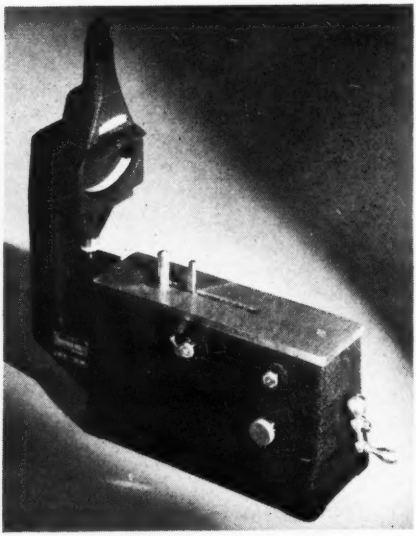
FINISHES *that aid in Appearance & Utility*

(Right)—This super-sensitive comparator especially designed for fine sensitivity and repetition qualities is finished in black crinkle enamel.

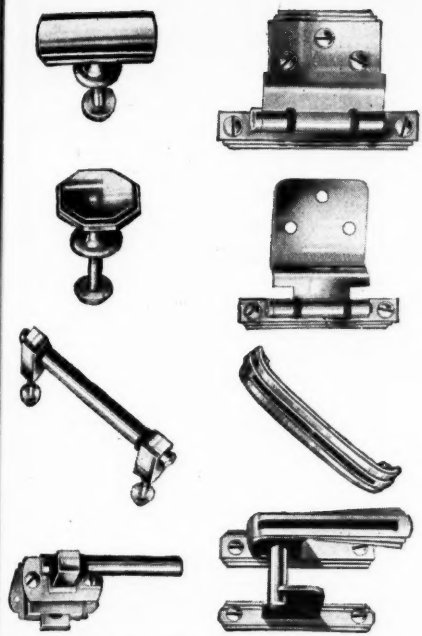


(Photo courtesy Federal Products Corporation)

(Photo courtesy Sheffield Gage Corporation)



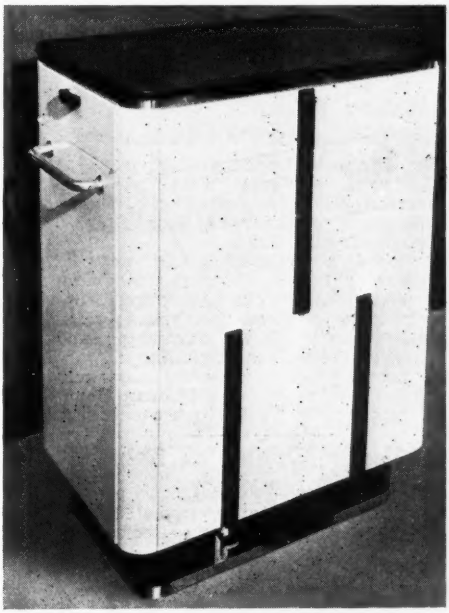
(Left)—An abrasive-resistant coating of wrinkle enamel on this universal internal measuring machine provides protection against hard usage in service. This type of finish is easy to keep clean.



(Photo courtesy The Stanley Works)

(Left)—Handsomely-wrought pieces of kitchen and bathroom hardware add enough color to brighten a room when finished in the "Multichrome" style. This hardware is chromium plated and trimmed with an insert of color that will not peel off or fade.

(Photo courtesy Designers for Industry)



(Right) — The portable dental operating cabinet shown here is smartly styled with dark trimmed stripes, base and top to achieve a contrast against the light body. Cabinets of this type are available finished in any of the standard Aulflex colors.

NEWS of the Industry

Treadwell of Maas & Waldstein Transferred to Upper New York State

W. C. Treadwell, for several years New England representative of Maas & Waldstein Company, makers of industrial finishes, 438 Riverside Ave., Newark, N. J., is now covering upper New York State for his company, with headquarters at Rochester, New York.

Mr. Treadwell, who is a finishing engineer of wide experience, brings to users of industrial finishes in his new territory an expert knowledge of electroplating and metal finishing in all their phases.

Plating Products Appointed Distributors for Maizo

The Plating Products Company, 352 Mulberry St., Newark, N. J., has been appointed the New Jersey distributors for Maizo, a product made by the Maizo Mills, Circleville, Ohio.

Maizo is a plater's drying material which is said to combine the following characteristics: higher absorption properties than hardwood sawdust; free from dust; suitable for burnishing and all drying operations, including oil absorption in place of sawdust. Carload stock is carried by The Plating Products Company at its Newark plant.

Hewitt Celebrates 80th Anniversary

Hewitt Rubber Corporation, Buffalo, N. Y., manufacturers of hose, conveyor, bucket elevator and transmission belting, is celebrating this year the 80th Anniversary of the founding in 1859 of the Gutta Percha and Rubber Mfg. Co., Hewitt parent company. Outstanding in the success of the Hewitt Rubber Corporation are the activities of Hewitt research laboratory, which, under the direction of Michael Berman, has contributed greatly to the rubber manufacturing industry of this country.

New York Belting & Packing Company Announces Distributors

The Buffalo Mill Supply Co., Inc., 210 Main St., Buffalo, N. Y., has been appointed distributor of the complete line of mechanical rubber goods manufactured by the New York Belting & Packing Company, 1 Market St., Passaic, N. J., in its territory.

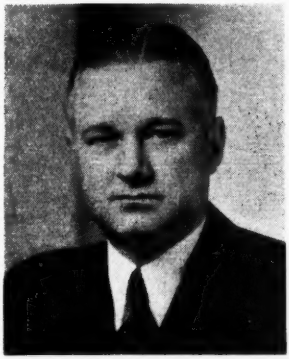
The Northern Automotive Supply Co., Saginaw, Mich., has also been appointed distributor of the N. Y. B. & P. line of mechanical rubber goods, according to a recent announcement made by Mr. B. F. Ruether, general manager of the company. In addition to its main office at 813 E. Genesee Ave., Saginaw, this distributor maintains a branch at Fourth and Saginaw Sts., Bay City, Michigan.

H. B. Spackman New Lyon Director

At the Lyon Metal Products, Incorporated Board of Directors' Meeting, held recently, Mr. H. B. Spackman, Vice President in Charge of Sales, was made a Director of the company. Mr. Spack-

man has been with Lyon for the past two years, coming to them from the U. S. Gypsum Company.

Lyon Metal Products has its head-



H. B. Spackman

quarters at Aurora, Ill., and another factory in Chicago Heights and plants on both coasts.

This company manufactures a complete line of steel storage equipment, also steel chain store fixtures.

Swen G. Pulson Appointed Sweden Representative for Norton Company

Norton Company, Worcester, Mass., announces the addition of Swen G. Pulson to its staff of European experts. He will have headquarters in Sweden and will work with Norton distributors in Sweden, Finland, Norway and Denmark. Mr. Pulson, a graduate of Worcester Polytechnic Institute, has been with Norton Company for about 15 years, and most recently was field engineer in the Cleveland district.

Herbert A. Stanton, vice president and European manager of Norton Company, and Harry N. Harding, special European representative for the Machine Division, recently returned to London after visits to the home plant.

McKay of International Nickel Speaks at A. E. S. Meeting

"Some Practical Features of High Nickel Alloys and Electro Deposits" was the topic of a talk given by Mr. R. J. McKay, chemical engineer, The International Nickel Company, Inc., 67 Wall St., New York, N. Y., on March 27th at Toledo, Ohio, before the joint meeting of the Detroit Chapter (Toledo Group) of the American Society for Metals, and the Toledo Branch of the American Electro-Platers' Society.

Mr. McKay pointed out the corrosion resistance and other properties of the high nickel non-ferrous alloys and also the fact that these properties can be used to a greater extent in electroplating than is the present common practice. A main point stressed by the speaker was that a heavy enough electro-deposit be given to show the true properties of nickel, unaffected by the metal base.

Armco Reorganization of Sheet and Strip Sales Division

A home office reorganization of the Sheet and Strip Sales Division has been announced by W. W. Sebald, vice-president of The American Rolling Mill Company, Middletown, Ohio.

F. A. Tobitt has been appointed manager of Eastern Sales, J. A. Ingwersen, manager of Midwestern Sales, and G.

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DISTRICT REPRESENTATIVES IN PRINCIPAL CITIES

W. Breiel, manager of Southern-Western Sales.

F. A. Tobitt joined the company in 1912 and has held various executive sales positions. For the past six years he has been manager of Armco's enameling sheet sales.

J. A. Ingwersen has been identified with the company for the past 15 years, first in employment service and later in sales work. He became manager of hot and cold rolled sales in 1932.

G. W. Breiel joined the Armco sales organization in 1927, and was made manager of galvanized and long terne sales in 1932.

R. J. Snelling Joins The Watson-Standard Co.

The Watson-Standard Co., Pittsburgh, Pa., has announced the appointment of Mr. R. J. Snelling as a member of its sales staff. Mr. Snelling in 1924 became chief chemist for the Pittsburgh Lacquer & Chemical Co. In 1924 he held the same position with the Paint and Varnish Division of Thews-Harbison-Thews, finally joining the Impervious Varnish Co., as technical director in 1929, where he remained until this year.

Under Mr. Snelling's direction, the first flexible rubber coating was designed that could be applied to either vulcanized or unvulcanized rubber compound. Later this work was carried on into the designing of automatic machines for coating balls, fabrics and other rubberized products.

Mr. Snelling is to be congratulated on his connection with The Watson-Standard Company, particularly because of this company's activity in the production of prescription finishes for particular materials, products and processes. Watson-Standard has been known for years as one of the leading manufacturers of paints, varnishes, lacquers, industrial coatings and special finishes for paper printing and metal lithography.

Foundry Equipment Manufacturers Association Arrange Annual Meeting

Arthur J. Tuscany of the trade association management firm of Tuscany, Turner and Associates, executive secretary of the Foundry Equipment Manufacturers Association, Penton Bldg., Cleveland, Ohio, announces selection by the board of directors of the organization for the annual meeting of the group.

Such matters as election of directors, reports on various types of association activity for the year were among the subjects to receive attention. In addition, consideration was given to the industry's position under the Fair Labor Standards Act or Wage-Hour Bill. The time which has intervened since the fall meeting of the Association, shortly after which the new law became effective, has permitted observation of different phases of this law and the situation will be considered in the light of recent developments.

Another subject to receive attention was the status of patents in relation to the new conditions brought about by the National Economic Committee's investigation and the apparent intention of the Department of Justice to introduce certain new legislation pertaining to the broad subject of patents.

P&H Appoints Tennessee Agent

The Harnischfeger Corporation, Milwaukee, Wis., manufacturers of overhead traveling cranes, hoists, excavators

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and other materials handling equipment, has announced the appointment of Kingsport Electric Company, Inc., Kingsport, Tenn., as exclusive agents for the sales of P&H hoists in that area. Kingsport Electric Company will operate under the direction of the Memphis office of the Harnischfeger Corporation.

Executive Personnel of Wire Department Changes at U. S. Rubber Company

A number of important changes in the executive personnel of the Wire Department, United States Rubber Company, Mechanical Goods Division, 1790 Broadway, New York, N. Y., were announced recently by C. W. Higbee, Manager, Wire Sales.

M. P. Lewis, former Eastern District Manager, Wire Sales, has been appointed assistant manager, Wire Sales Department, with headquarters at the Company's main office, 1790 Broadway, New York City.

Mr. Lewis has a long, successful experience in the electrical industry, having joined United States Rubber Company in 1919. He started his service with the company at the Bristol, R. I., wire factory, where he was employed for two years in the sales and service departments. In 1921 he came to the New York sales office. For the first year and a half at this branch he handled important industrial accounts in the territory. Following this, he took over important electrical industry accounts in the New York Branch, as well. He quickly won the favorable attention of men in the electrical industry, and two years ago he was placed in charge of sales of the Eastern District of United States Rubber Company.

H. H. Weber, assistant manager, Wire Sales Department, since 1934, has been appointed commercial engineer of that department. Previously, he was in the engineering divisions of the Rome Wire Co., and the General Cable Corporation. He is a member of the A.I.E.E., A.S.T.M., National Municipal Signal Association, National Electrical Manufacturers Association, National Fire Protection Association, and American Standards Association.

A. M. Harp — Midwestern Sales Manager

American Machine & Metals, Inc., announces the appointment of A. M. Harp as Midwestern District Sales Manager of the DeBothezat Ventilating Equipment Division, well-known manufacturers of axial flow pressure fans and blowers. He is making his headquarters at the company's Chicago offices, 35 E. Wacker Drive. Mr. Harp for the past ten years has been handling sales engineering work for DeBothezat, specializing in marine and industrial applications at the New York offices. In Chicago, he will co-operate with agents and engineers in the application of DeBothezat products to the air conditioning and general industrial and marine fields.

H. Follette Hodgkins Appointed General Manager of Rollway Bearing Company, Inc.

According to a recent announcement, Mr. H. Follette Hodgkins, president of the Rollway Bearing Company, Inc., 451 Seymour St., Syracuse, N. Y., has taken over the general managership of that company. Mr. Hodgkins is also president of W. C. Lipe, Inc., machinery manufacturers located in Syracuse, New York.

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A finishing grain. Chemically treated to facilitate "greasing." Sizes 100-240 incl.

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NEW Plant equipment and MATERIALS

Tolhurst Centrifugal Galvanizer

A newly designed galvanizer known as the "Tolhurst Centrifugal Galvanizer" which is said to insure a more even finish for hot tinned and galvanized articles has been placed on the market by Tolhurst Centrifugal Division, American Machine and Metals, Inc., 100 Sixth Ave., New York, N. Y. Bolts, nuts, threaded pieces, stampings, all kinds of hardware, castings, and fittings can be handled quickly and the metal coatings obtained are said to be free from hangings and lumps. Threaded parts and fine perforations are produced clean and clear.

Tolhurst Centrifugal Galvanizer

The Tolhurst Centrifugal Galvanizer consists essentially of a removable basket and retaining cage which is mounted within a casing. The basket, also used as a container for the work, is carried through the hot metal bath in the usual manner and then placed in the centrifugal galvanizer and rotated. The centrifugal force of the turning basket throws off the excess spelter, leaving an even layer of metal with a high quality finish. The thickness of the coating is controlled by the acceleration of the machine and final speed attained.

The motor of the unit is provided with variable speed and acceleration so that all types of work may be processed with equal ease. The casing of the unit is equipped with hinged sides for the recovery of slingings, which can be returned to the melting kettle.

The Tolhurst Centrifugal Galvanizer is built in three sizes, the largest of which is available for handling articles up to 24 in. in length. The rated load capacity is 100 lbs. and 60 to 75 loads per hour are obtainable.

Roller-Type Jar Mills

Maximum convenience at low cost in the grinding and pulverizing of pigments, chemicals, and so on is said to be possible now with the "Roller-Type" Jar Mills now being marketed by The United States Stoneware Co., Akron, Ohio. This type of mill requires no clamping into frames or housings. The jar is placed

on the revolving rollers which are rubber-covered steel and are mounted in brass-bushed bearings.

The revolving rollers can also be used in many cases where rapid, efficient mixing action is desired.

Standard sizes of the "Roller-Type" Jar Mills are available to accommodate

Roller-Type Jar Mills

one, two, three or four "Loxeal" Jars, either of the 1, 1½ or 2-gallon sizes. Due to the sturdy and rugged construction, according to the manufacturer, these mills are guaranteed for heavy duty and are good for a lifetime of continuous operation.

Loxeal Jars are made of chemical stoneware and tapered at one end to a 4½-in. opening. The lids are gasketed and held in place by means of a patented clamp.

The motors are of the continuous-duty, geared-head type. The one and two jar machines are supplied with ¼ h.p., 110-volt, single-phase, 60 cycle motors. The outside dimensions of the one-jar size of the Roller-Type Jar Mill are 13 in. wide x 25 in. long. The two-jar mill is 13 in. wide x 42 in. long, each extra jar adding about 17 in. to the length.

Jubilee Spray Hose

New York Belting & Packing Co., 1 Market St., Passaic, N. J., has recently placed on the market a high pressure spray hose to be known as the "Jubilee." This spray hose is made of a high grade tube that is said to resist deteriorating action of spray solutions and is composed of three braided plies of super-strength yarn, particularly developed for high pressure work. This 800-lb. hose has a cover of high grade black abrasive resisting stock. This hose is made in sizes of ⅜ in., $\frac{7}{16}$ in., and ½ in. inside diameter.

Binks Streamlined Automatic Spray Gun

Binks Manufacturing Company, 3124 W. Carroll Ave., Chicago, Ill., has placed on the market a streamlined automatic spray gun, to be known as the "Thor Model No. 21." This automatic spray gun is offered in connection with an improved 3-Way Valve for cam, hand, or foot operation of the air plunger. The 3-Way Valve automatically operates the trigger of the gun.

The Thor Model No. 21 is said to of-

METALPREP

"Used First — Makes Your Paint Finish Last"

PROVIDES A FIRM, LASTING BOND BETWEEN METAL AND PAINT.

Use Metalprep to clean and prepare all sheet metal surfaces before painting. Removes rust and grease.

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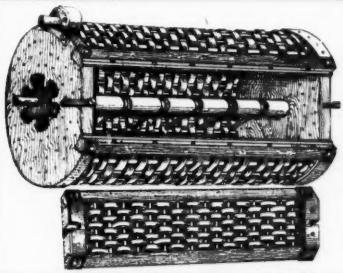

Cleaner - Faster - Smoother Plating

with KING Plating Barrels

A wood woven cylinder adaptable to any barrel plating tank. The woven construction allows maximum agitation and produces a clean, smooth plate. Barrel should not rotate more than 2 r.p.m. Speed means wear, not plate. Made in two diameters: 12½" and 16". Lengths: up to 48". Write for illustrated folder.

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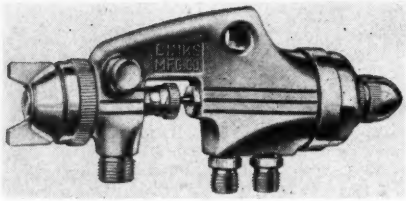

Binks Streamlined Automatic Spray Gun

fer new perfections in timing and spraying efficiency. Dripping and spitting are said to be eliminated. A positive action of the air plunger gives spraying results equal to hand operated guns.

The Thor Model No. 21 Automatic Spray Gun is available in set-ups for all modern finishing materials, including lacquer, synthetic enamels, and ceramic or vitreous materials.

R-700

An unusual Rust Inhibitive.
Dries with lacquer speed.
Very flexible baking schedule.
Resists salt spray remarkably.
Very light in color.
Ideal vehicle for bronze powders and pastes.
Suggested wherever RUST is a production problem.
Remarkably adherent as primer under baked finishes.
Variations for special requirements available.
Our pamphlet will be gladly sent on request.

The Varnish Products Co.
5208 HARVARD AVENUE
CLEVELAND, OHIO

Miccro Supreme Clear Stop-Off Lacquer

Michigan Chrome Company, 6342 E. Jefferson Ave., Detroit, Mich., has added a new, clear, non-pigmented lacquer to the established line of Miccro Supreme Stop-Off Lacquers. This new coating material was developed to meet the demand of concerns who prefer the non-pigmented type of lacquer for insulating their plating racks.

This lacquer is compatible in every way with the red and black stop-off lacquers which this company has been manufacturing for rack insulation purposes. It can be applied directly on a metal surface with no treatment necessary other than a thorough cleaning of the surface to be coated. According to the manufacturer, it has proved to be practically unaffected through the regular cycle of decorative plating. It is said to be very effective in processes such as concentrated or diluted hydrochloric aicd or sulphuric acid dips, cyanide or acid copper baths, standard or bright nickel baths and chromic acid baths. It is also impervious to nitric and hydrofluoric acids and has proved satisfactory for use with degreasing units.

Wilbur & Williams "Metal Dip"

A coating for new metal tools, to be known as "Metal Dip," which is said to prevent tarnishing during storage and transportation, has been placed on the market by The Wilbur & Williams Company, Park Square Bldg., Boston, Mass. Metal Dip can be applied to tools made of copper, steel, brass, or any other base metal.

Metal Dip is said to have the quality of drying in about 30 seconds to a very thin film which completely coats the metal surface and prevents tarnishing. The coating material is colorless and practically invisible when used in a dipping bath.

Oriental Rouge is the ideal rouge for obtaining a mirror-like finish on stainless steel, silver, gold and all other metals. Write for details.

Oriental Rouge Co., Inc.
Established 1901
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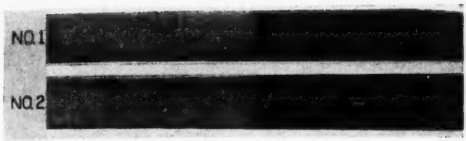

Illustration showing two bright copper strips. The left half of each strip was dipped in Metal Dip and allowed to dry for one minute in air and then exposed to chemical fumes for 24 hours. No. 1 was exposed to chlorine gas and No. 2 was exposed to hydrogen sulphide gas.

Metal Dip is said to have excellent adhesion on smooth metal surfaces. It can be applied to any clean metal surface, free of dirt, grease, or oil, by dipping or spraying.

Dampney Coating No. 2

"Coating No. 2" is the designation of a metal surface protecting coating which is now being marketed by Dampney Co. of America, 1243 River St., Hyde Park, Mass. Coating No. 2 is made for application with a brush in a manner similar to painting and can be used primarily to protect metal surfaces against attack by oxygen, acids, alkalies, chlorides, sulphides, oils, fats, and alcohol solutions. The material is also said to protect the surface against electrochemical corrosion. One gallon will cover approximately 300 sq. ft. with a single coat.

The metal surface to which Coating No. 2 is applied must be cleaned to remove all scale, oil, and moisture by employing sand or grit for air blasting or a similarly effective means. The first coating, of a recommended two or three, is then applied at an average thickness of 0.003 inch. The coating is rubbed into the surface and the second is applied after approximately one hour interval for drying in air. The coated surface is ready for use after 24 to 36 hours of drying in air, or three or four hours if heat at 180 deg. F. is employed in the drying operation.

Goodrich Burst-Proof Steam Hose

A steam hose, to be known as "Burst-Proof," has been placed on the market by The B. F. Goodrich Company, Akron, Ohio. The tube of the Burst-Proof Steam Hose is made from a compound which is said to possess great heat resisting properties and a capacity to resist steam from penetrating into the hose carcass and through the cover.

On sizes 1¼ in. and larger, one ply of strong asbestos woven fabric and a spiral wire reinforcement are placed between the wire braids. Tests have shown that asbestos fabric serves to a better advantage on large hose sizes,

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

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since the asbestos is a slow conductor of heat and will prolong the life of the hose.

The use of the spiral reinforcement is said to prevent to a marked degree collapse and kinking when the hose is flexed or moved by means of a sling or some similar device.

On hose sizes of 1 in. and under a braided asbestos fabric is used.

Goodrich Burst-Proof Steam Hose is recommended for saturated steam pressures up to 200 lbs. per square inch, or super-heated steam up to 390 deg. F. This steam hose is available in a range of sizes from ⅜ in. to 2½ inches.

Pail Tipper

A drum cradle, to be known as "Pail Tipper," for use in suspending a five-gallon drum in a hinged ring for dispening a liquid has been placed on the market by Vol-U-Meter Co., 75 Wilbury Place, Buffalo, New York.

The Pail Tipper consists of an angle-iron frame with a hinged ring and support strap. The strap extends upward at the rear of the assembly to form a handle. The hinging point of the Pail Tipper stands above the center of gravity of the drum so it will ride in the support strap normally in upright position, and will return to this position after the tipping handle has been released. The face of the framework extends toward the front to provide stability.

Vol-U-Meter Pail Tipper

Wheelco Dial-Indicating Thermometer

A dial-indicating thermometer for use in connection with dry kilns, pre-heaters, baking ovens, drying ovens, japanning and enameling, industrial washing machines, air ducts, and so on has been placed on the market by Wheelco Instruments Co., 1931 S. Halsted St., Chicago, Illinois.

The Wheelco Dial-Indicating Thermometer is available in two models—

RUST-I-CIDE "50"
Cleans, etches, and prepares metal for a perfect finishing job.
It can help your product.
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PLEASING IN APPEARANCE WITH UP TO THE MINUTE FEATURES BUILT INTO THEM
Mechanical Process Corp.
SOUTH ORANGE, N. J.
Specialists in the use and handling of chlorinated solvents . . .

one for long-distance installation, and one for mounting at temperature point.

The accuracy and simplicity in design, for which the entire Wheelco line

Long-Distance Type Wheelco Dial-Indicating Thermometer

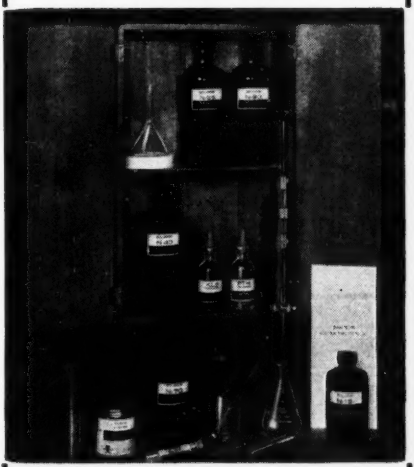
of instruments is famous, is the basis of the Dial-Indicating Thermometer. These instruments are highly sensitive, accurate and durable and, according to the manufacturer, will be found to comply with the most exacting industrial requirements on applications dealing in temperatures from 0 deg. F. to 1,000 degrees Fahrenheit.

The Wheelco Dial-Indicating Thermometer is ruggedly constructed for long, dependable and accurate service. The instrument is enclosed in a cast case with a wide open six-inch dial face and large, easily-read, black on white numerals. Both the long-distance type and stem type instruments are available in mercury, gas-filled or vapor actuations. Change of the temperature at the bulb causes an expansion or contraction of the sensitive gas or liquid fill within the system, which actuates the Bourdon Tube and moves the temperature indicator across the face of the easily-read dial with minute accuracy.

The long-distance type Wheelco Dial-Indicating Thermometer consists of a sensitive bulb, capillary connecting tube and Bourdon Tube measuring movement. This instrument is made for installation at some distance from the point of temperature taking, without affecting accuracy.

The stem type Wheelco Dial-Indicating Thermometer is available with either bottom or back connected stem. These instruments are used for location at the point of temperature taking, when such location is in plain view and conveniently accessible. The stem type incorporates the same high standards as in the long-distance type, with large, open-face and easily-read numerals.

NEW—Test Sets For SILVER and TIN
ELECTROPLATING SOLUTIONS



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KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

Glidden Duotone

A new baking metal-finishing material which is said to meet industrial utility and appearance demands, to be known as "Duotone," has been placed on the market by The Glidden Company, Berea Rd. at Madison Ave., Cleveland, Ohio. This material is designed especially for use on various gradings of metal and is said to produce a uniform two-tone effect in one spray application.

Duotone is available in a wide variety of colors applicable to a wide diversification of production. It is said to be easy to apply, unaffected by varying oven conditions, and produces a consistently uniform finish.

Aluminum Ladder for Finishing Department

An aluminum ladder which can be used to serve many useful purposes around the finishing department has been placed on the market by The Aluminum Ladder Company, 147 Fifth Ave., Tarentum, Pa. This ladder is of the platform type and may be used industrially in many ways to speed up handling and storage of products on shelves and bins. Casters which are provided on the back legs are said to make it easy to move the aluminum ladder from place to place.

The aluminum ladder is designated as the "Solid-type No. 206" and is made of 51 S. T. Alcoa aluminum, having a tensile strength of 48,000 pounds per square inch. The aluminum ladder weighs 43 pounds and is said to easily support a load of 1,000 pounds. The bottom dimension of the ladder measures 28 x 22 in. and the platform, 22 x 22 in. The platform is located 66 in. from the floor.

Aluminum Ladder for Finishing Department

The Aluminum Solid-type No. 206 Ladder will not rust and is ruggedly riveted together and can be easily cleaned.

Comet Electric Hoist

An electric hoist which can be plugged into an ordinary lamp socket, to be known as the CM "Comet" has been placed on the market by Chisholm-Moore Hoist Corporation, 348 Fremont Ave., Tonawanda, N. Y. This type of hoist is said to combine dependability of large scale hoisting equipment with compact, light weight convenience.

The CM Comet Hoist can be easily carried and installed by one man, and

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SAVE from 60% to 92% of your present polishing costs. Write today for full details—No obligation.

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Automatically — todays Method of Finishing
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is powered by a specially built, heavy duty high torque motor that runs on an ordinary light circuit or 3-phase power line. No special installation or

CM "Comet" Portable Electric Hoist

accessories are required and it can be used anywhere.

For materials handling, the CM Comet is said to afford a rugged, versatile tool that will save time and energy. The compact design and ease of operation make the Comet especially valuable for service on production lines.

The construction of the Comet is compact and rugged, yet unusually light in weight. Precision ball bearings are provided at each rotating point. Gears of the unit are precision machined heat-treated alloy steel. The controlling mechanism, with a patented "delayed reversing" feature, operates easily with one hand and affords an extremely scientific control for lifting the load distances of a fraction of an inch.

The brake of the Comet is smooth, quick-acting, positive and can be easily adjusted. Herc-alloy "double-duty" chain, which is extra strong and flexible and also kink-proof, is used. The upper and lower safety stops can be used to automatically limit travel of the load hook.

The Comet is offered in four capacities. 250, 500, 750, and 1,000 lbs. The 500-lb. size weighs only 85 pounds.

Hartford Triple-Action Cutting Barrel

The motor driven cutting barrel shown herewith for use in cutting down, wet and dry grinding, tumbling, puverizing, and mixing has been recently placed on the market by The Hartford Steel Ball Co., P. O. Box 146, Station A, Hartford,

SHEET STEEL COMES CLEAN AT 250 F.P.M.

SHEET STEEL is cleaned at 250 feet per minute with a five second immersion in a Metso bath—just one example of the fast, thorough cleaning that Metso insures. Balanced properties of alkali and silica maintain efficiency so that Metso baths last longer.

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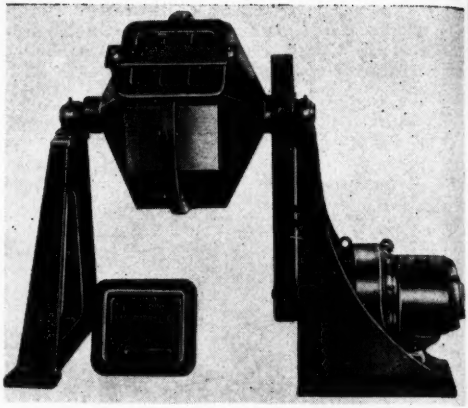
THE BUCKINGHAM PRODUCTS CO. 8900 HUBBELL AVE. DETROIT, MICH.
MANUFACTURERS OF A COMPLETE LINE OF
Buffing and Polishing Compositions

Conn. The outstanding feature of this type of barrel is in its shape. The construction is said to produce a triple-action in tumbling the material—an "over and over" end to end "folding-in" motion combined, which might be compared to the action of the water which flows over a waterfall and churns in from each side the back-water as it flows up to the head of the pool. This multiple action quickly grinds off burrs and finishes and smooths the general surface of any article in the load.

The greatest use for this type of barrel is in wet grinding—usually termed sand rolling (sand and water).

The Hartford barrel shown here is fitted with both a solid and a strainer cover. The solid covers are equipped with automatic pressure relief valves. The barrel body castings are made of a special alloy which is said to insure long life and rapid cutting action.

This barrel is furnished complete with a built-in U. S. Syncrogear, Type G.D., 2 h.p. motor. An automatic magnetic starting switch is included, together with a remote control push button station. The motor drives a roller chain and sprocket which is completely protected with a shield. Hartford Triple-Action Cutting Barrels are recommended for the finishing of parts for casters, ball bearings, screw machines, small iron and bronze castings, hardware, roller bearings, typewriter and office machine parts, wrenches, airplane parts, locks, link chains, many varied stampings, and so on.



Hartford Triple-Action Cutting Barrel

Lyon Showerway

A self-contained unit which is said to provide the means for 100 per cent sanitary hand washing, to be known as "Showerway," has been placed on the market by Lyon Metal Products, Incorporated, 1304 River St., Aurora, Ill. The claim of 100 per cent sanitation is based on the fact that the warm, showering water is released by a foot pedal and the liquid soap comes out all around a soap plunger, cleaning it each time it is used.

Check In AT DE WITT OPERATED HOTELS
In Cleveland
HOTEL HOLLENDEN
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THE NEIL HOUSE
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THE MAYFLOWER
In Jamestown, N. Y.
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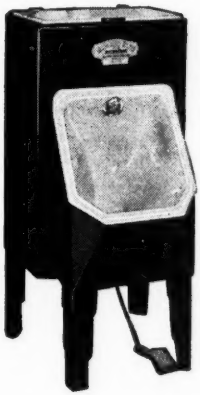
1509 Spring Garden St. Philadelphia, Pa.

The "Showerway" is self-contained in that the water is held in the unit itself, in a six-gallon stainless steel tank. Stepping on a foot pedal releases the water through a showerhead by gravity. There is no force, consequently a thorough handwashing can be had with from six to eight ounces of water.



Lyon Showerway

Another unique feature is the fact that Showerway provides its own heat. The water is heated right inside the unit. In the case of electrically heated models, water is also thermostatically controlled so that it is held at an even temperature.

There are three models of Showerway available. One of the models is for use where no running water or electricity is available, another where electricity is available but no running water and the third, automatic, model is for use where both running water and electricity are available. The automatic model can be connected with the regular city water supply and drain.

The Showerway unit is about the size of a small refrigerator, fabricated of metal throughout and the body is finished in dark green enamel. The bowl is finished in light green porcelain enamel.

Hydall Paint

A paint supplied in paste form to mix with water for application on interior walls and ceilings of finishing departments, to be known as "Hydall," has been placed on the market by United Laboratories, Inc., 16370 Euclid Ave., Cleveland, Ohio. Hydall can be applied directly over fresh dry plaster, new cement or mortar. The finish will dry in approximately 50 minutes at a temperature of 70 degrees F.

Hydall is said to be free from odor and is not affected by lime or alkalies. One gallon mixed with the proper amount of water will cover approximately 1,200 sq. ft. in one coat.

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600 BATHS
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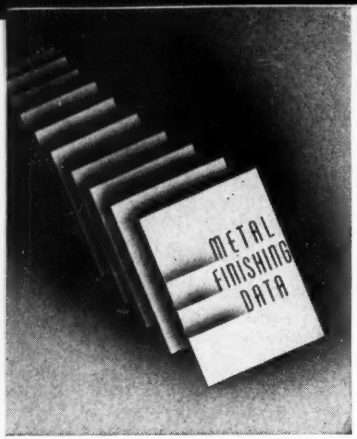

for your CATALOG library

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Falstrom Industrial Ovens and Dryers
A 4-page catalog illustrating and describing such features as performance, economy, and ruggedness of Falstrom Engineered Ovens. Falstrom Co., Main Ave., Passaic, New Jersey.

2. Enamelers' Reference No. 3
The refining of enamelers' clay by Dr. G. H. Spencer-Strong is the subject of this 12-page catalog now being issued by The Porcelain Enamel & Mfg. Company, Eastern and Pemco Aves., Baltimore, Maryland.

3. Hartford Triple-Action Cutting Barrels
Information regarding the methods and equipment for "cutting down" in much less time and at much less expense are described in this catalog now being issued by The Hartford Steel Ball Co., P. O. Box 146, Station A, Hartford, Connecticut.

4. Save-Toil
Synthetic organic compounds for all industrial and general cleaning purposes are described in this catalog now being issued by Apex Chemical Mfg. Corp., 545 E. Hancock Ave., Detroit, Michigan.

5. Automatic Composition Applicator
Circular describing the new Hammond "Auto-Doper" which applies composition automatically to buffing wheels is now available. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Michigan.

6. Control Your Electroplating Process
A method of determining pH by means of Taylor slide comparators is explained in simple terms in a catalog now being issued by W. A. Taylor & Company, Inc., 872 Linden Ave., Baltimore, Md.

7. Improved Air Cleaning for Industry
A beautifully illustrated catalog describing the Centri-Merge Method of cleaning air is now being issued by Schmieg Sheet Metal Works, 320 Piquette Ave., Detroit, Michigan.

8. Sargent Electrometric Titration Assembly
A folder describing the new applications that are now possible for the electrometric titration method being marketed by E. H. Sargent & Co., 155 E. Superior St., Chicago, Illinois.

9. Hovey Spray Equipment
A 4-page catalog describing and illustrating Hovey spray painting guns and painting outfits is now being issued by Hovey Spray Equipment Co., 1509 Spring Garden St., Philadelphia, Pa.

10. Metal Preparation Before Finishing
A folder describing the practical use of Rusticide "50" in preparing metal surfaces before paint. Rusticide Products Co., 3125 Perkins Ave., Cleveland, Ohio.
See page 64.

11. Speedip Whirl Enameler
A 4-page bulletin describing a combination dipping-whirling machine for completely coating large quantities of parts with lacquer, enamel, paint or any other liquid finishing material. Ronci Machine Co., 45 River Ave., Providence, R. I.

12. Protective and Decorative Finishes
Hilo Varnish Corporation, 42-60 Stewart Ave., Brooklyn, N. Y., presents Bulletin No. 15 titled, "The Five Hilo Rip-pls."

13. Airway Ventilated Buffs
Cool cutting buffs for high speed buffing operations are illustrated and described in a 4-page folder now being distributed by Jackson Buff Corporation, 21-03 41st Ave., Long Island City, New York.

14. Continuous Feed Sand Blast Equipment
This catalog tells how a uniform surface finish can be obtained by the sand blast method. Leiman Bros., Inc., 4W-23 Walker St., New York City.

15. Metal Cleaning Hints
An interesting bulletin giving details on Metalprep Rust and Grease Remover. Tells how Metalprep makes metals safe for paint. Neilson Chemical Co., 6564 Benson St., Detroit, Michigan.

16. Alkali Cleaning Compounds
A new bulletin has been released by Detroit Rex Products Co., 13017 Hillview Ave., Detroit, Mich., describing Triad Alkali Cleaning Compounds.

17. Industrial Ovens
Two new bulletins giving full particulars on air heaters and industrial ovens. J. O. Ross Engineering Corporation, 350 Madison Ave., New York, N. Y.

18. Bonderizing
The Parker Process that holds paint to steel and resists rust, known as "Bonderizing," is described in this catalog now being issued by Parker Rust-Proof Company, 2172 E. Milwaukee Ave., Detroit, Michigan.

19. Spray Painting and Finishing Equipment
A most complete catalog describing and illustrating spray painting and finishing equipment manufactured by Binks Manufacturing Company, 3114-40 Carroll Ave., Chicago, Illinois.

20. Woven Wood Plating Barrel
Folder describing many features of the King woven wood plating barrel. John King, 48 Springfield St., Dayton, Ohio.

21. Aluminum Oxide Abrasive Grain
A 4-page cataleg describing "Borolon," an aluminum oxide abrasive grain for the polishing trade and general industrial use. Abrasive Company, Tacony and Fraley Sts., Philadelphia, Pa.

22. Corrosion-Proof Laboratory Equipment
The bulletin designated as No. 503 in which acid-proof chemical stoneware is illustrated and described is being issued by The U. S. Stoneware Co., Akron, O.

23. Flexible Shaft Driven Power Tools
Catalog describing the complete line of Biax and Jarvis Flexible Shaft machines, together with accessory equipment and tools. The Charles L. Jarvis Company, Middletown, Conn.

Print plainly in filling out coupon for literature.

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